STIC Search Report
EIC 2100

STIC Database Tracking Number: 196598

TO: Jacques Veillard **Location: RND 3A30** **Art Unit: 2165** **Thursday, July 27, 2006** **Case Serial Number: 09/939167**	**From: Emory Damron** **Location: EIC 2100** **RND 4B19** **Phone: 571-272-3520** **Emory.Damron@uspto.gov**

Search Notes

Dear Jacques,

Please find below your fast and focused search results.
References of potential pertinence have been tagged, but please review all the packets in case you like something I didn't.
Of those references which have been tagged, please note any manual highlighting which I've done within the document.

There may be a few decent references contained herein, but I'll let you determine how useful they may be to you.
Please contact me if I can refocus or expand any aspect of this case, and please take a moment to provide any feedback (on the form provided) so EIC 2100 may better serve your needs. Good Luck!

Sincerely,
Emory Damron
Technical Information Specialist
EIC 2100, US Patent & Trademark Office
Phone: (571) 272-3520
Emory.damron@uspto.gov

```
Set     Items   Description
S1    3780121   TIME? OR CHRONOLOG? OR TEMPORAL? OR CLOCK? OR REALTIME? OR
            LIVETIME? OR DATE OR CALENDAR? OR DAY
S2     415226   ZONE?
S3       2167   (CST OR PST OR MST OR GST OR ZST OR EST OR ZULU OR GREENWI-
            CH OR CENTRAL OR PACIFIC OR MOUNTAIN OR EASTERN OR ATLANTIC OR
             AST)(2N)(STANDARDTIME? OR TIME?)
S4     823126   REGION? OR GEOGRAPH? OR COUNTR? OR LATITUDE?(3N)LONGITUD?
S5     179397   GPS OR GLOSNASS OR NATION? OR INTERNATION? OR PHYSICAL()LO-
            CATION?
S6      11316   GLOBAL()POSITION?
S7          7   TIMEZONE?
S8     235746   (S1 AND S2:S6) OR S7
S9      11769   STAMP? OR MARK? OR TAG OR TAGS OR TAGG? OR FLAG? ? OR FLAG-
            G????
S10     19458   INCORPORAT? OR EMBED? OR BRAND? OR IMPRINT? OR SEAL??? OR -
            SIGNATUR? OR IMPRIMATUR?
S11     56360   INSERT? OR INJECT? OR INFIX? OR ATTACH? OR AFFIX? OR ENCAP-
            SULAT? OR INTEGRAT? OR IMPLANT? OR WRAP? OR ENCLOS?
S12     20480   IMBED? OR ATTACH? OR APPEND? OR BIND? OR INCAPSULAT? OR EM-
            PLANT?
S13        72   TIMESTAMP? OR TIMEMAP? OR TIMEMARK? OR TIMETAG?
S14      4226   FILE? OR DATAFILE? OR FOLDER? OR DATAFOLDER? OR DIRECTORYF-
            ILE? OR DATA()RECORD?
S15      4594   INDEX? OR DIRECTORY? OR DIRECTORIE? OR COMPUTERFILE? OR DA-
            TARECORD?
S16       193   DATA()(TABLE? OR COLUMN? OR ROW? ?)
S17     11388   NAME? OR EXTENSION? OR DESIGNATION? OR LABEL? OR METADATA?
            OR META()DATA?
S18     11994   IDENTIFIER? OR POINTER? OR INDICATER? OR INDICATOR? OR MAR-
            KER? OR ID
S19      5183   TITLE? OR IDENTIT? OR BRAND? OR APPELLATION?
S20      8860   SORT? OR RANK? OR HIERARCH? OR HIERAT? OR PRIORIT? OR PECK-
            ING()ORDER?
S21      7754   LISTING? OR CATEGOR? OR CLASSIF? OR TAXONOM? OR ORGANIZ? OR
             ORGANIS?
S22     16729   IC=G06F?
S23     25097   MC=(T01? OR S02?)
S24     10171   S8 AND (S13 OR S1(5N)S9:S12)
S25        14   S24 AND S14:S15(5N)S17:S19
S26       355   S14:S15(5N)S17:S19 AND S8
S27       118   S26 AND S9:S13
S28       118   S25 OR S27
S29        30   S28 AND S20:S21
S30        73   S28 AND S22:S23
S31       118   S27:S30
S32        66   S31 AND AC=US/PR
S33        53   S32 AND AY=(1970:2001)/PR
S34        40   S32 NOT AY=(2002:2006)/PR
S35        52   S31 NOT S32
S36        30   S35 AND PY=1970:2001
S37        20   S35 NOT PY=2002:2006
S38        83   S33:S34 OR S36:S37
S39        83   IDPAT (sorted in duplicate/non-duplicate order)
File 347:JAPIO Dec 1976-2005/Dec(Updated 060404)
        (c) 2006 JPO & JAPIO
File 350:Derwent WPIX 1963-2006/UD=200646
        (c) 2006 The Thomson Corporation
```

39/3,K/23 (Item 23 from file: 350)
DIALOG(R)File 350:Derwent WPIX

0011226423 - Drawing available
WPI ACC NO: 2002-165760/ **200222**
XRPX Acc No: N2002-126585
Multimedia data retrieval method where files are indexed by data and location and information stored either in file name **or in a** file **that accompanies directory**
Patent Assignee: TOSHIBA KK (TOKE)
Inventor: KANAI T; MAEDA S; YANO H; YAO H
Patent Family (5 patents, 30 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	
EP 1139239	A2	20011004	EP 2001302833	A	20010327	200222	B
JP 2001282813	A	20011012	JP 200091024	A	20000329	200222	E
KR 2001093654	A	20011029	KR 200111761	A	20010307	200223	E
CN 1378156	A	20021106	CN 2001111870	A	20010322	200316	E
US 20030069893	A1	20030410	US 2001820364	A	20010329	200327	E

Priority Applications (no., kind, date): JP 200091024 A 20000329

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing Notes
EP 1139239	A2	EN	56	35	

Regional Designated States,Original: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR

JP 2001282813	A	JA	28		

200222 ...
...**retrieval method where files are indexed by data and location and information stored either in** file name **or in a** file **that accompanies directory**

Original Titles:
...Scheme for multimedia data retrieval using event names and **time** or location information...

...Scheme for multimedia data retrieval using event names and **time** /location information

Alerting Abstract ...NOVELTY - Files are **classified** by both **date** of picture being taken and **geographic** location of multimedia data. They can then be recalled by specifying a precise **time** , range of **times** , a specific location or range of locations. A front end can display thumbnail pictures overlaid on a map, or on a **timeline** . ...ADVANTAGE - Files are **classified** by human concepts and does not require **attaching** of keywords ...

Class Codes
International Classification (Main): **G06F-017/30**
(Additional/Secondary): **G06F-012/00** ...
Manual Codes (EPI/S-X): **T01-J05B** ...

... **T01-J05B2**

Original Publication Data by Authority

Original Abstracts:

...retrieval device, each one of a plurality of multimedia data is managed in relation to **time** information and/or location information indicating a **time** and/or a location at which each multimedia data is created. Then, the **time** information and/or the location information corresponding to a retrieval request are obtained upon receiving...

...and multimedia data are retrieved from the plurality of multimedia data according to the obtained **time** information and/or location information...

...retrieval device, each one of a plurality of multimedia data is managed in relation to **time** information and/or location information indicating a **time** and/or a location at which each multimedia data is created. Then, the **time** information and/or the location information corresponding to a retrieval request are obtained upon receiving...
...and multimedia data are retrieved from the plurality of multimedia data according to the obtained **time** information and/or location information.

Claims:

...method, comprising:(a) managing each one of a plurality of multimedia data in relation to **time** information and/or location information indicating a **time** and/or a location at which each multimedia data is created;(b) obtaining the **time** information and/or the location information corresponding to a retrieval request upon receiving the retrieval...

...data from the plurality of multimedia data managed by the step (a), according to the **time** information and/or the location information obtained by the step (b...

...method, comprising:(a) managing each one of a plurality of multimedia data in relation to **time** information and/or location information indicating a **time** and/or a location at which each multimedia data is

created;(b) obtaining the **time** information and/or the location information corresponding to a retrieval request upon receiving the retrieval...

...data from the plurality of multimedia data managed by the step (a), according to the **time** information and/or the location information obtained by the step (b).

39/3,K/27 (Item 27 from file: 350)
DIALOG(R)File 350:Derwent WPIX

0010791363 - Drawing available
WPI ACC NO: 2001-406796/
Related WPI Acc No: 1999-492595
XRPX Acc No: N2001-300844
Real time **differential** global positioning **system error connection method in Internet, involves processing received information using error correction information**
Patent Assignee: TRIMBLE NAVIGATION LTD (TRIM-N)
Inventor: FRANCE P G; PERREAULT P D
Patent Family (1 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update
US 6212475	B1	20010403	US 1996702761	A	19960822	200143 B
			US 1999337567	A	19990622	

Priority Applications (no., kind, date): US 1996702761 A 19960822; US 1999337567 A 19990622

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing Notes
US 6212475	B1	EN	14	6	Continuation of application US 1996702761 Continuation of patent US 5928306

see claims attached

Real time **differential** global positioning **system error connection method in Internet, involves processing received information using error correction information**

Original Titles:
Method and apparatus for automated different **GPS** processing.

Alerting Abstract ...NOVELTY - A differential **global positioning** system (DGPS) error correction information is transmitted to server couple to DGPS base station. **GPS** information is received by rover GPS unit communicating with wireless server and is processed with transmitted error correction information.DESCRIPTION - An INDEPENDENT CLAIM is also included for differential **global positioning** system...

...USE - For error correction of near real **time** differential **global positioning** system (DGPS) in Internet application...

...ADVANTAGE - Allows real **time** correction of **GPS** information using wireless Internet connection...
...DESCRIPTION OF DRAWINGS - The figure shows the computer arrangement for retrieving **GPS** correction information over global Internet.

Title Terms.../Index Terms/Additional Words: **TIME** ;

Class Codes
Manual Codes (EPI/S-X): **T01-H07C3** ...

... **T01-H07C5A** ...

... **T01-H07C5E** ...

... T01-J06B1

Original Publication Data by Authority

Original Abstracts:

GPS position information is collected and stored in a computer system. The **GPS** position information includes **time - stamps** that indicates when the **GPS** position information was collected. The computer system uses the **time stamps** to generate an error correction **file name** for an error correction **file** that can be used to correct the **GPS** position information. Using the generated error correction **file name** , the computer system connects to a file server that stores differential **GPS** error correction files and copies the needed differential **GPS** error correction file. The computer system connects to the DGPS file server using the File Transfer Protocol of the global Internet. The computer system then corrects the **GPS** position information in the computer system using the retrieved DGPS error correction file.

Claims:

A method of near real- **time** Differential **Global Positioning** System (DGPS) error correction, said method comprising: generating DGPS error correction information on a DGPS...

...location; transmitting DGPS error correction information to a server coupled to said base station; receiving **Global Positioning** System (**GPS**) information on a rover **GPS** unit, said rover **GPS** unit having a wireless connection; and processing said **GPS** information with said DGPS error correction information.

39/3,K/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

0013939197 - Drawing available
WPI ACC NO: 2004-119479/200412
Related WPI Acc No: 1995-200530; 1996-518986; 1997-310156; 1998-009129; 1998-110064; 1998-286225; 1999-204782; 1999-444465; 2000-013122; 2000-194736; 2000-195398; 2000-365779; 2000-490584; 2000-647035; 2001-022904; 2001-335855; 2001-357503; 2001-374044; 2001-397673; 2001-425330; 2001-570080; 2001-580828; 2001-581298; 2001-581665; 2001-595705; 2001-607222; 2002-011177; 2002-041658; 2002-062159; 2002-082807; 2002-154357; 2002-163652; 2002-163681; 2002-179003; 2002-188040; 2002-205513; 2002-224088; 2002-226224; 2002-235400; 2002-236852; 2002-238406; 2002-238913; 2002-239839; 2002-254659; 2002-256143; 2002-268672; 2002-315095; 2002-361599; 2002-361694; 2002-370756; 2002-382444; 2002-391512; 2002-392708; 2002-394013; 2002-403568; 2002-405083; 2002-413035; 2002-435593; 2002-470507; 2002-498079; 2002-498923; 2002-507125; 2002-508021; 2002-528507; 2002-528580; 2002-556177; 2002-598690; 2002-598923; 2002-617280; 2002-636862; 2002-642228; 2002-654787; 2002-672857; 2002-673567; 2002-691185; 2002-697772; 2003-045908; 2003-056645; 2003-057552; 2003-067657; 2003-074123; 2003-090293; 2003-091652; 2003-137905; 2003-174573; 2003-199024; 2003-219596; 2003-237888; 2003-238411; 2003-266622; 2003-268467; 2003-275465; 2003-327510; 2003-330044; 2003-331365; 2003-353776; 2003-362315; 2003-391983; 2003-392393; 2003-401297; 2003-418353; 2003-418436; 2003-419661; 2003-419904; 2003-465734; 2003-492022; 2003-557490; 2003-567053; 2003-587433; 2003-597620; 2003-615418; 2003-615425; 2003-655604; 2003-655616; 2003-655715; 2003-656012; 2003-658647; 2003-659691; 2003-687554; 2003-689852; 2003-707329; 2003-730410; 2003-767701; 2003-777048; 2003-800216; 2003-800961; 2003-802603; 2003-829683; 2003-897231; 2004-031964; 2004-059015; 2004-059948; 2004-070353; 2004-098221; 2004-155399; 2004-179244; 2004-179245; 2004-303569; 2004-386915; 2004-487761; 2004-624728; 2004-698601; 2004-831629; 2005-079360; 2005-110869; 2005-171601; 2005-259866; 2005-261577; 2005-381648; 2005-432722; 2005-504460; 2005-521089; 2005-617272; 2005-637818; 2005-655503; 2005-689292; 2005-700681; 2005-703000; 2005-776856; 2005-784522; 2005-793708; 2006-086183; 2006-115379; 2006-133346; 2006-134064; 2006-163034; 2006-190576; 2006-190840; 2006-191970; 2006-250548; 2006-250572; 2006-298779; 2006-379466; 2006-391180; 2006-432149; 2006-453744
XRPX Acc No: N2004-095452

Video and image location data digitally watermarking method for aerial platform e.g. satellite, involves providing geovector corresponding to location depicted in one frame of video and digitally watermarking geovector in frame

Patent Assignee: LEVY K L (LEVY-I); RHOADS G B (RHOA-I); STEWART S W (STEW-I)
Inventor: LEVY K L; RHOADS G B; STEWART S W

Patent Family (1 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update
US 20030215110	A1	20031120	US 2001800093	A	20010305	200412 B
			US 2001284163	P	20010416	
			US 2001284776	P	20010418	
			US 20012954	A	20011023	

US 2002359041 P 20020220
US 2003371995 A 20030220

Priority Applications (no., kind, date): US 2002359041 P 20020220; US 20012954 A 20011023; US 2001284776 P 20010418; US 2001284163 P 20010416; US 2001800093 A 20010305; US 2003371995 A 20030220

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing Notes
US 20030215110	A1	EN	17	7	C-I-P of application US 2001800093 Related to Provisional US 2001284163 Related to Provisional US 2001284776 C-I-P of application US 20012954 Related to Provisional US 2002359041

Original Titles:
Embedding location data in video

Alerting Abstract ...in a database and the information is accessed through a pointer, where the geovector comprises **longitude** , **latitude** , altitude, **time** cardinal direction, azimuth and sensory characteristics. The geovector is digitally watermarked in the video frame....DESCRIPTION OF DRAWINGS - The drawing shows a flow diagram depicting a method of **embedding** a geovector in image data including video.

Class Codes
Manual Codes (EPI/S-X): **S02-B04** ...

... **T01-J04C** ...

... **T01-J10D** ...

... **T01-J12C**
Original Publication Data by Authority

Original Abstracts:
...object and areas depicted in the video. A geovector may include location coordinates such as **longitude** , **latitude** , altitude, etc. In one implementation, geovector information is **embedded** within a video frame so as to correspond with an area depicted in the video frame's center or off-center location. In a second implementation, a geovector includes an **identifier** or **indexing** protocol for use in a video management system.

US 20030215110A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2003/0215110 A1**

Rhoads et al. (43) **Pub. Date: Nov. 20, 2003**

(54) **EMBEDDING LOCATION DATA IN VIDEO**

(76) Inventors: **Geoffrey B. Rhoads**, West Linn, OR (US); **Kenneth L. Levy**, Stevenson, WA (US); **Steven W. Stewart**, Tualatin, OR (US)

Correspondence Address:
DIGIMARC CORPORATION
19801 SW 72ND AVENUE
SUITE 100
TUALATIN, OR 97062 (US)

(21) Appl. No.: **10/371,995**

(22) Filed: **Feb. 20, 2003**

Related U.S. Application Data

(63) Continuation-in-part of application No. 10/002,954, filed on Oct. 23, 2001, which is a continuation-in-part of application No. 09/800,093, filed on Mar. 5, 2001.

(60) Provisional application No. 60/359,041, filed on Feb. 20, 2002. Provisional application No. 60/284,163, filed on Apr. 16, 2001. Provisional application No. 60/284,776, filed on Apr. 18, 2001.

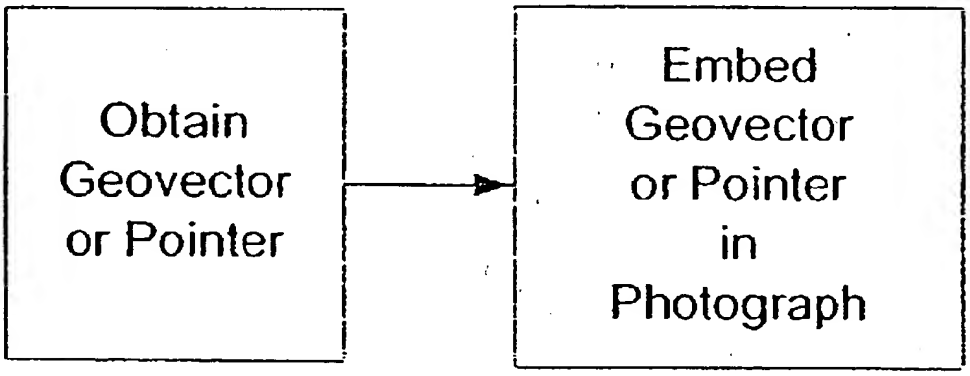
Publication Classification

(51) **Int. Cl.**[7] **G06K 9/00**

(52) **U.S. Cl.** **382/100**

(57) **ABSTRACT**

Digital watermarking technology is used to convey location data for images or objects depicted in video. A digital watermark may associate geovector information with the video or object and areas depicted in the video. A geovector may include location coordinates such as longitude, latitude, altitude, etc. In one implementation, geovector information is embedded within a video frame so as to correspond with an area depicted in the video frame's center or off-center location. In a second implementation, a geovector includes an identifier or indexing protocol for use in a video management system.



geospatial or geography information and services standards are formalized and/or updated, the geovector can be formatted to include the reference locators described in that standard. Similarly, instead of a geovector, geo-coordinates or other location information can be provided via a watermark or watermark index. The term "geovector" is sometimes broadly used herein to encompass these alternatives).

[0115] There are many embodiments discussed herein which may benefit from the inclusion of two different watermarks. For example, a first watermark may include information regarding (or pointing to) geovector information, while a second watermark includes a database identifier or location. The second watermark may alternatively include (or point toward) information pertaining to events, people or animals identified in the photograph, occasions, groups, institutions, copyright ownership, etc. Or the embodiment may include both a robust geovector watermark and a copy-tamper fragile watermark.

[0116] While particular reference was made to Digital Elevation Models and albedo maps, the same principles are likewise applicable to other forms of maps, e.g., vegetative, population, area, thermal, etc., etc.

[0117] While one of the illustrated embodiments correlated incoming imagery with a projective image based on the master DEM/map, in other embodiments a reference other than the master DEM/map may be used. For example, a projection based just on part of the historical data from which the DEM/map was compiled can be used (e.g., one or more component data sets that are regarded as having the highest accuracy, such as based directly on ground truths).

[0118] Although not belabored, artisans will understand that the systems described above can be implemented using a variety of hardware and software systems. One embodiment employs a computer or workstation with a large disk library, and capable database software (such as is available from Microsoft, Oracle, etc.). The registration, watermarking, and other operations can be performed in accordance with software instructions stored in the disk library or on other storage media, and executed by a processor in the computer as needed. (Alternatively, dedicated hardware, or programmable logic circuits, can be employed for such operations).

[0119] Certain of the techniques detailed above find far application beyond the context in which they are illustrated. For example, equipping an imaging instrument with an optical shutter that imparts a watermark to an image finds application in digital cinema (e.g., in watermarking a theatrical movie with information indicating the theatre's geo-location, date, time, and/or auditorium location for a given screening).

[0120] The various section headings in this application are provided for the reader's convenience and provide no substantive limitations. The features found in one section may be readily combined with those features in another section.

[0121] In view of the wide variety of embodiments to which the principles and features discussed above can be applied, it should be apparent that the detailed embodiments are illustrative only and should not be taken as limiting the scope of the invention. Rather, we claim as our invention all such modifications as may come within the scope and spirit of the following claims and equivalents thereof.

What is claimed is:

1. A method of digitally watermarking location data within video captured from an aerial platform comprising the steps of:

providing a geovector corresponding to a location depicted in at least one frame of the video; and

digitally watermarking the geovector in the at least one frame.

2. The method according to claim 1, wherein the geovector comprises at least longitude and latitude coordinates.

3. The method according to claim 2, wherein the aerial platform includes at least one of a satellite, helicopter, unmanned aircraft and aircraft.

4. The method of claim 3, wherein the geovector further comprises at least the altitude of the aerial platform.

5. The method of claim 2, wherein the geovector further comprises at least one of altitude, time, cardinal direction, azimuth and sensory characteristics.

6. The method according to claim 1, wherein the geovector comprises a pointer.

7. The method according to claim 6, further comprising the steps of storing geovector information in a database and accessing the geovector information via the pointer, wherein the geovector information comprises at least one of longitude, latitude, altitude, time cardinal direction, azimuth and sensory characteristics.

8. The method according to claim 4, wherein the geovector is obtained from a GPS receiver.

9. The method of claim 4, wherein the digital watermark is embedded in real-time with respect to capture of the at least one video frame.

10. A method to identify video, the video comprising video frames captured from an aerial platform, the aerial platform including at least one of a satellite, helicopter, unmanned aircraft, space shuttle and aircraft, an improvement comprising steganographically embedding data in the video, the data comprising first location data corresponding to at least a first location depicted in the video and second location data corresponding to at least a second location depicted in the video, the first location data differing from the second location data.

11. The method of claim 10, wherein the first location data and the second location data each comprise at least longitude and latitude coordinates.

12. The method of claim 11, wherein the first location data and the second location data each further comprise time data and at least one of altitude of the aerial platform at video capture and video capture angle.

13. The method of claim 10, wherein the first location data and the second location data respectively correspond to at least one of a first location of the aerial platform and a first aerial platform viewing perspective, and a second location of the aerial platform and a second aerial platform viewing perspective.

14. A method of steganographically marking video captured from an aerial platform, the video comprising at least a first video frame and a second video frame, the first video frame depicting a first terrestrial area having a first geo-location and the second video frame depicting a second terrestrial area having a second geo-location, said method comprises the steps of:

providing a first steganographic signal in the first video frame, the first steganographic signal comprising first location data corresponding to at least the first geo-location; and

providing a second steganographic signal in the second video frame, the second steganographic signal comprising at least a representation of a difference between the first geo-location and the second geo-location.

15. The method of claim 14, wherein the representation comprises a pointer to a data record including a difference between the first geo-location and the second geo-location.

16. The method of claim 14, wherein the steganographically marking comprises digital watermarking.

17. A method of digitally watermarking video comprising the steps of:

digitally watermarking a first area in a first video frame to include a first payload associated with at least a ground coordinate of the first area; and

digitally watermarking a second area in a second video frame to include a second payload that represents a difference between a ground coordinate of the second area and the first area ground coordinate.

18. The method of claim 17, wherein the first area and second areas are located in the same spatial frame position with respect to one another.

19. A method of digitally watermarking a video sequence comprising the steps of:

inserting a first digital watermark identifier at a first location within the video sequence, the first digital watermark identifier signaling that the first location corresponds with a predetermined geographical location; and

inserting a plurality of digital watermark identifiers throughout the video sequence, wherein each of the plurality of digital watermark identifiers represents a change in geographical coordinates with respect to the first location.

20. The method of claim 19, wherein the change comprises a predetermined geographic distance.

* * * * *

39/3,K/32 (Item 32 from file: 350)
DIALOG(R)File 350:Derwent WPIX

0010611719 - Drawing available
WPI ACC NO: 2001-217656/200122
XRPX Acc No: N2001-155147
Software updating in client server environment, involves requesting down load to client computer for update files **whose** names **are specified in operating system independent and operating system specific sections**
Patent Assignee: 3COM CORP (THRE-N)
Inventor: CHILES A A; CHILES D C; MANBECK J L; NGUYEN V H
Patent Family (1 patents, 1 countries)

Patent			Application			
Number	Kind	Date	Number	Kind	Date	Update
US 6167567	A	20001226	US 199873054	A	19980505	200122 B

Priority Applications (no., kind, date): US 199873054 A 19980505

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing Notes
US 6167567	A	EN	37	14	

Software updating in client server environment, involves requesting down load to client computer for update files **whose** names **are specified in operating system independent and operating system specific sections**

Alerting Abstract ...update files from the network server such that either one of two groups of update **file names** are specified in operating system (O/S) independent section and O/S specific section. DESCRIPTION - A **country** or locale within which client computer is situated is determined and then the **file name** containing an update script for use in **country** or locale is constructed. During processing of script, an operating system is determined then the...

...and O/S independent sections. When the O/S independent section specifies a first update **file name** extracting a first group of update **file names** from O/S independent section and the first group has an associated update **file name** . Whereas when the O/S specific section of script corresponds to O/S executing on client computer executes and specifies second update **file name** which is extracted from second group having an associated update **file name** . An INDEPENDENT CLAIM is also included for apparatus for updating software...

...any client-resident software via networked server without any user intervention and also amount for **regional** or local update differences. Since identical updates as desired by administrator can be propagated to... ...new version of its own software become available. Simplifies overall task of software updating thereby **markedly** reduces cost for manufacturing network administration and user...

Class Codes
International Classification (Main): **G06F-009/445**
Manual Codes (EPI/S-X): **T01-H07C3** ...

... **T01-J20B2** ...

... **T01-M02A1B**

Original Publication Data by Authority

Original Abstracts:
...network server for each software product to be updated and, where appropriate, for each different **country** or locale in which that product will be installed. At a scheduled **time** , the client computer automatically, through an executing updating application: establishes a network connection to the server; constructs a **file name** for a **file** containing an appropriate update script; and then downloads that file from the server. The script...

...is to occur through a web site or through the script, and if the latter, **listings** of operating system (O/S) specific and O/S-independent product update files. For a...
Claims:
...through a network server, comprising the steps of, in a client computer:(A) determining a **country** or a locale within which the client computer is situated and, in response thereto, constructing a **file name** for a **file** containing an update script for use in the **country** or the locale;(B) issuing a request to the network server to download the file...

...O/S-independent sections:(C2a) if the O/S-independent section specifies a first update **file name** , extracting a first group of update **file names** from the O/S-independent section, the first group having at least one associated update **file name** ; and(C2b) if the O/S-specific section of the script corresponds to the O/S executing on the client computer and specifies a second update **file name** , extracting a second group of update **file names** from the O/S-independent section, the second group having at least one associated update **file name** ; and(C3) requesting a download to the client computer of update files from the network server corresponding to the first and second groups of update **file names** , to the extent at least one of the first and second groups of **file names** are specified in the O/S-independent and O/S-specific sections.

US006167567A

United States Patent [19]

Chiles et al.

[11] Patent Number: 6,167,567

[45] Date of Patent: Dec. 26, 2000

[54] TECHNIQUE FOR AUTOMATICALLY UPDATING SOFTWARE STORED ON A CLIENT COMPUTER IN A NETWORKED CLIENT-SERVER ENVIRONMENT

[75] Inventors: **Anthony A. Chiles**, Manassas, Va.; **David C. Chiles**, Mitchellville, Md.; **Jackie Lee Manbeck, Jr.**, Herndon; **Vu Hoanh Nguyen**, Manassas Park, both of Va.

[73] Assignee: **3Com Corporation**, Santa Clara, Calif.

[21] Appl. No.: **09/073,054**

[22] Filed: **May 5, 1998**

[51] **Int. Cl.**[7] **G06F 9/445**

[52] **U.S. Cl.** **717/11**

[58] **Field of Search** 395/712; 704/8; 707/203; 709/200, 221; 717/11

[56] **References Cited**

U.S. PATENT DOCUMENTS

5,247,683	9/1993	Holmes et al.	709/221
5,555,416	9/1996	Owens et al.	717/11
5,675,802	10/1997	Allen et al.	717/3
5,742,829	4/1998	Davis et al.	717/11
5,790,796	8/1998	Sadowsky	709/221
5,794,218	8/1998	Jennings et al.	705/35
5,835,777	11/1998	Staelin	717/11
5,835,911	11/1998	Nakagawa et al.	707/203
5,845,090	12/1998	Collins et al.	709/221
5,859,969	1/1999	Oki et al.	709/200
5,860,012	1/1999	Luu	717/11
5,903,859	5/1999	Stone et al.	704/8

OTHER PUBLICATIONS

"Introducing Dynamic Update", Elltech Development, Inc. downloaded from *http://www. elltechdev. com/products/dyn-updt. htm* on Apr. 11, 1998 (page last dated Mar. 13, 1998), pp. 1–3.

"Tools The Rule!", Elltech Development, Inc. downloaded from *http:/www. elltechdev. com/index. html* on Apr. 11. 1998 (page last updated Apr. 10, 1998), pp. 1–4.

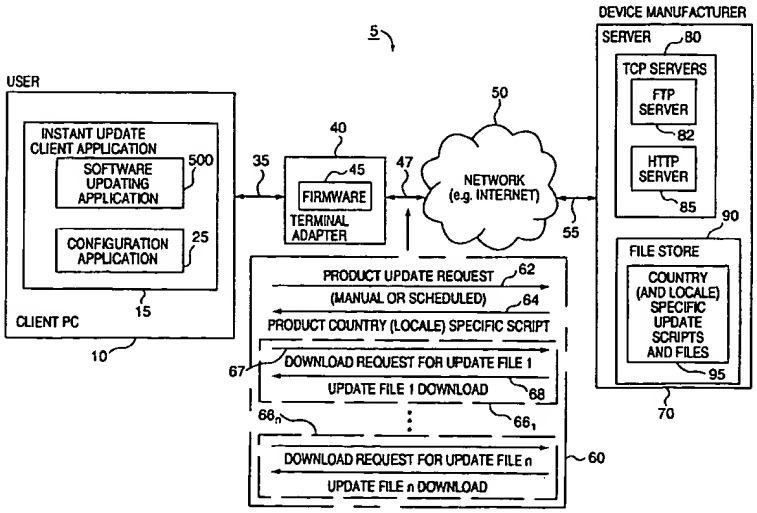
IBM, Using Resource Bundles to Internationalize Text Java and Mulit-language Applications, http://www.ibm.com/services/bustran/java/wpresour.html, Jun. 2000.

Primary Examiner—Tariq R. Hafiz
Assistant Examiner—Hoang-Vu Antony Nguyen-Ba
Attorney, Agent, or Firm—Michaelson & Wallace; Peter L. Michaelson

[57] **ABSTRACT**

A technique for automatically updating software, including but not limited to application programs, residing on, e.g., a client computer. Specifically, an update script is stored on a network server for each software product to be updated and, where appropriate, for each different country or locale in which that product will be installed. At a scheduled time, the client computer automatically, through an executing updating application: establishes a network connection to the server; constructs a file name for a file containing an appropriate update script; and then downloads that file from the server. The script contains appropriate update information, including whether the update is to occur through a web site or through the script, and if the latter, listings of operating system (O/S) specific and O/S-independent product update files. For a script-based update, the updating application downloads those update files, as specified by the script, corresponding to the executing O/S and then, in a sequence specified in the script, executes various files therein to complete the update. Once the update successfully concludes, the updating application appropriately updates the locally stored version number of the installed software and schedules the next update accordingly.

33 Claims, 18 Drawing Sheets



update site is to be made through a LAN, specifically a TCP/IP connection, or through a dial-up connection, with for the latter the user specifying a phone book entry (containing a telephone number to dial for a remote network access port) and a name to be used for that connection. Lastly, through "general" screen display **1470**, the user can indicate, for a selected product, whether (s)he is to confirm all updates (or not), specify a user name and password, where provided by the update site owner, for the update site for that product and, where appropriate, an update site address for that product (the user name, password and product site would override the defaults stored in the registry) so as to install, on a one-time basis, e.g., a "beta" release of that product from a different site than a default update site. Generally, a user name, password and product site address are not entered in screen display **1470** such that updating application **500** will utilize the defaults, stored in the registry, for the selected product. However, the update site address would revert back to a registered (default) address whenever the user de-selects product site and user name boxes shown in screen display **1470**.

Though we discussed our invention in the context of updating firmware stored in a telecommunications device (specifically a terminal adapter) used with a client PC, by now any one skilled in the art will clearly realize that our present invention can be used to update software for any device used with a client PC, regardless of the purpose of that device, provided the software appropriately registers itself with the client PC for updating through our inventive technique either while that software is being installed or, upon user command, thereafter.

In addition, though we have discussed our invention in the context of using the same site for custom web and script-based (FTP) updates of a product, these sites can be different. To accommodate this, appropriate data can be added to the update script to specify a different custom web update site, rather than a default URL stored in the registry during product registration. In this instance, the update script Ini processor would transfer the web site URL in the script to the browser in lieu of the default FTP site specified in the registry. Hence, the manufacturer or network administrator (whichever entity owns the update script) can easily change the custom web update site, as needed, without effecting changes in any client registry.

Moreover, our present invention is not limited to updating software that resides on a client PC itself. In that regard, the invention can be used to update software residing anywhere in a network provided a client PC, which is executing the updating application (specifically application **500**), can access the software that is to be updated. Hence, the present invention is applicable to updating not only software associated with devices connected to the client PC but also software associated with network-connected devices to which the client has access.

Though we have described our invention for updating executable software, such as drivers, firmware, application programs, device configurations and O/S components, our invention can also be used to download and disseminate non-executable files, which are not necessarily update files, from an update site to client PCs. Such non-executable files can contain user information pertinent to an installed product, such as, e.g., new product information, help information, and/or user notifications from a product manufacturer. In that regard, a non-executable information file can be automatically downloaded with an instruction in the script to then ask the user whether (s)he wants to then view the file. If so, an instruction in the script can launch a local word processor or text editor on that file to properly display the information contained in the file to the user. Such a non-executable file can also be a stored profile, which provides configuration and/or other operational settings, for use with a particular product installed in networked client PCs. In this manner, a network administrator of, e.g., an enterprise-wide network, can store a common profile for a product—whether it is hardware or software (and whether it is updateable or not), and, through use of our present invention, propagate that profile and install it on each networked client PC that contains that product, hence automatically permitting the product to be uniformly configured on each such client. This, in turn, facilitates network-wide consistency and yields reduced network-wide support costs.

Furthermore, though we have described our invention in conjunction primarily with the Windows operating systems, the teachings of the invention are applicable for use with nearly any other embedded hardware device capable of network communication or client operating system, such as, e.g., UNIX or Solaris operating systems ("UNIX" and "Solaris" being registered trademarks of UNIX Systems Laboratories and Sun Microsystems, Inc., respectively), that can support a network connection between the client and a server and undertake file transfer operations therebetween.

Although a single embodiment, along with various modifications and extensions thereof, which incorporates the teachings of our present invention has been shown and described in detail herein, those skilled in the art can readily devise many other embodiments and variants thereof that still utilize these teachings.

We claim:

1. A method for updating software in a client-server environment through a network server, comprising the steps of, in a client computer:

(A) determining a country or a locale within which the client computer is situated and, in response thereto, constructing a file name for a file containing an update script for use in the country or the locale;

(B) issuing a request to the network server to download the file containing the update script to the client computer; and

(C) processing the script on the client computer so as to complete an update of the software, wherein the processing step comprises the steps of:

(C1) determining an operating system (O/S) then executing on the client computer; and

(C2) wherein the update script comprises at least one of O/S-specific and O/S-independent sections:

(C2a) if the O/S-independent section specifies a first update file name, extracting a first group of update file names from the O/S-independent section, the first group having at least one associated update file name; and

(C2b) if the O/S-specific section of the script corresponds to the O/S executing on the client computer and specifies a second update file name, extracting a second group of update file names from the O/S-independent section, the second group having at least one associated update file name; and

(C3) requesting a download to the client computer of update files from the network server corresponding to the first and second groups of update file names, to the extent at least one of the first and second groups of file names are specified in the O/S-independent and O/S-specific sections.

2. The method in claim **1** wherein the software is installed on the client computer, on a device connected to the client

computer wherein the client computer has access to the software, or on any device to which the client computer can establish a network connection and wherein the client computer has access to the software.

3. The method in claim 2 further comprising the step of issuing, in the event no country or locale specific update file can be found on the server, a request to the server to download a predefined update file, to the client computer, containing a default update script.

4. The method in claim 1 where the first and second groups of update file names comprise first and second groups of names of "copy" files, respectively, and first and second groups of names of "run" files, respectively, wherein the processing step further comprises the steps of:

copying each of the update files in the first and second groups of "copy" files from the network server into local storage on the client computer so as to form transferred "copy" files;

copying each of the update files in the first and second groups of "run" files from the network server into the local storage so as to form transferred "run" files; and

executing, from local storage, each of the transferred "run" files, in the order each of said "run" files was transferred from the network server to the client computer, so as to install the update, the update being collectively implemented by the transferred "copy" files and the transferred "run" files.

5. The method in claim 4 further comprising the step of storing each of the transferred "copy" files and each of the transferred "run" files into an associated destination directory, in the local storage, as specified in the update script.

6. The method in claim 5 wherein the software is an application program, firmware, device driver, device configuration, operating system or any component thereof.

7. The method on claim 5 wherein the update comprises a non-executable file to be transferred to the client computer, wherein the non-executable file comprises information, help or profile data.

8. The method in claim 7 further comprising the step of displaying the non-executable file, once transferred, to a user at the client computer.

9. A computer readable medium having computer executable instructions stored therein for performing the steps of claim 1.

10. A method for updating software in a client-server environment through a network server, comprising the steps of:

in a client computer:

(A) determining a country or a locale within which the client computer is situated and, in response thereto, constructing a file name for a file containing an update script for use in the country or the locale;

(B) issuing a request to the network server to download the file containing the update script to the client computer; and

(C) processing the script on the client computer so as to complete an update of the software, wherein the processing step comprises the steps of:

(C1) determining an operating system (O/S) then executing on the client computer; and

(C2) wherein the update script comprises at least one of O/S-specific and O/S-independent sections:

(C2a) if the O/S-independent section specifies a first update file name, extracting a first group of update file names from the O/S-independent section, the first group having at least one associated update file name; and

(C2b) if the O/S-specific section of the script corresponds to the O/S executing on the client computer and specifies a second update file name, extracting a second group of update file names from the O/S-independent section, the second group having at least one associated update file name; and

(C3) requesting a download to the client computer of update files from the network server corresponding to the first and second groups of update file names, to the extent at least one of the first and second groups of file names are specified in the O/S-independent and O/S-specific sections; and

in the network server:

(D) downloading, in response to the request, the file containing the update script to the client computer.

11. The method in claim 1 wherein the software is installed on the client computer, on a device connected to the client computer wherein the client computer has access to the software, or on any device to which the client computer can establish a network connection and wherein the client computer has access to the software.

12. The method in claim 11 further comprising the step of:

in the client computer, issuing, in the event no country or locale specific update file can be found on the server, a request to the server to download a predefined update file, to the client computer, containing a default update script; and

in the network server, downloading, in response to the predefined update file download request, the predefined update file to the client computer.

13. The method in claim 1 where the first and second groups of update file names comprise first and second groups of names of "copy" files, respectively, and first and second groups of names of "run" files, respectively, wherein the processing step further comprises the steps of, in the client computer:

copying each of the update files in the first and second groups of "copy" files from the network server into local storage on the client computer so as to form transferred "copy" files;

copying each of the update files in the first and second groups of "run" files from the network server into the local storage so as to form transferred "run" files; and

executing, from local storage, each of the transferred "run" files, in the order each of said "run" files was transferred from the network server to the client computer, so as to install the update, the update being collectively implemented by the transferred "copy" files and the transferred "run" files.

14. The method in claim 13 further comprising the step of, in the client computer, storing each of the transferred "copy" files and each of the transferred "run" files into an associated destination directory, in the local storage, as specified in the update script.

15. The method in claim 14 wherein the software is an application program, firmware, device driver, device configuration, operating system or any component thereof.

16. The method on claim 14 wherein the update comprises a non-executable file to be transferred to the client computer, wherein the non-executable file comprises information, help or profile data.

17. The method in claim 16 further comprising the step of, in the client computer, displaying the non-executable file, once transferred, to a user at the client computer.

18. Apparatus for updating software in a client-server environment through a network server, comprising:

a client computer having

a processor; and

a memory, connected to the processor, having computer executable instructions stored therein; and

wherein, in response to the stored instructions, the processor:

(A) determines a country or a locale within which the client computer is situated and, in response thereto, constructing a file name for a file containing an update script for use in the country or the locale;

(B) issues a request to the network server to download the file containing the update script to the client computer; and

(C) processes the script on the client computer so as to complete an update of the software through which the processor:

(C1) determines an operating system (O/S) then executing on the client computer; and

(C2) wherein the update script comprises at least one of O/S-specific and O/S-independent sections:

(C2a) if the O/S-independent section specifies a first update file name, extracts a first group of update file names from the O/S-independent section, the first group having at least one associated update file name; and

(C2b) if the O/S-specific section of the script corresponds to the O/S executing on the client computer and specifies a second update file name, extracts a second group of update file names from the O/S-independent section, the second group having at least one associated update file name; and

(C3) requests a download to the client computer of update files from the network server corresponding to the first and second groups of update file names, to the extent at least one of the first and second groups of file names are specified in the O/S-independent and O/S-specific sections.

19. The apparatus in claim **18** wherein the software is installed on the client computer, on a device connected to the client computer wherein the client computer has access to the software, or on any device to which the client computer can establish a network connection and wherein the client computer has access to the software.

20. The apparatus in claim **19** wherein the processor, in response to the stored instructions, issues, in the event no country or locale specific update file can be found on the server, a request to the server to download a predefined update file, to the client computer, containing a default update script.

21. The apparatus in claim **18** where the first and second groups of update file names comprise first and second groups of names of "copy" files, respectively, and first and second groups of names of "run" files, respectively, wherein the processor, in response to the stored instructions:

copies each of the update files in the first and second groups of "copy" files from the network server into local storage on the client computer so as to form transferred "copy" files;

copies each of the update files in the first and second groups of "run" files from the network server into the local storage so as to form transferred "run" files; and

executes, from local storage, each of the transferred "run" files, in the order each of said "run" files was transferred from the network server to the client computer, so as to install the update, the update being collectively implemented by the transferred "copy" files and the transferred "run" files.

22. The apparatus in claim **21** further wherein the processor, in response to the stored instructions, stores each of the transferred "copy" files and each of the transferred "run" files into an associated destination directory, in the local storage, as specified in the update script.

23. The apparatus in claim **22** wherein the software is an application program, firmware, device driver, device configuration, operating system or any component thereof.

24. The apparatus on claim **22** wherein the update comprises a non-executable file to be transferred to the client computer, wherein the non-executable file comprises information, help or profile data.

25. The apparatus in claim **24** wherein the processor, in response to the stored instructions, displays the non-executable file, once transferred, to a user at the client computer.

26. Apparatus for updating software in a client-server environment through a network server, comprising:

a client computer having a processor; and

a memory, connected to the processor, having computer executable instructions stored therein; and

wherein, in response to the stored instructions, the processor:

(A) determines a country or a locale within which the client computer is situated and, in response thereto, constructing a file name for a file containing an update script for use in the country or the locale;

(B) issues a request to the network server to download the file containing the update script to the client computer; and

(C) processes the script on the client computer so as to complete an update of the software through which the processor:

(C1) determines an operating system (O/S) then executing on the client computer; and

(C2) wherein the update script comprises at least one of O/S-specific and O/S-independent sections:

(C2a) if the O/S-independent section specifies a first update file name, extracts a first group of update file names from the O/S-independent section, the first group having at least one associated update file name; and

(C2b) if the O/S-specific section of the script corresponds to the O/S executing on the client computer and specifies a second update file name, extracts a second group of update file names from the O/S-independent section, the second group having at least one associated update file name; and

(C3) requests a download to the client computer of update files from the network server corresponding to the first and second groups of update file names, to the extent at least one of the first and second groups of file names are specified in the O/S-independent and O/S-specific sections; and

the network server which:

(D) downloads, in response to the request, the file containing the update script to the client computer.

27. The apparatus in claim **26** wherein the software is installed on the client computer, on a device connected to the client computer wherein the client computer has access to the software, or on any device to which the client computer can establish a network connection and wherein the client computer has access to the software.

28. The apparatus in claim **27** wherein

the processor, in response to the stored instructions issues, in the event no country or locale specific update file can

be found on the server, a request to the server to download a predefined update file, to the client computer, containing a default update script; and

the network server downloads, in response to the predefined update file download request, the predefined update file to the client computer.

29. The apparatus in claim **26** where the first and second groups of update file names comprise first and second groups of names of "copy" files, respectively, and first and second groups of names of "run" files, respectively, wherein the processor, in response to the stored instructions:

copies each of the update files in the first and second groups of "copy" files from the network server into local storage on the client computer so as to form transferred "copy" files;

copies each of the update files in the first and second groups of "run" files from the network server into the local storage so as to form transferred "run" files; and

executes, from local storage, each of the transferred "run" files, in the order each of said "run" files was transferred from the network server to the client computer, so as to install the update, the update being collectively implemented by the transferred "copy" files and the transferred "run" files.

30. The apparatus in claim **29** wherein the processor in response to the stored instructions, stores each of the transferred "copy" files and each of the transferred "run" files into an associated destination directory, in the local storage, as specified in the update script.

31. The apparatus in claim **30** wherein the software is an application program, firmware, device driver, device configuration, operating system or any component thereof.

32. The apparatus on claim **30** wherein the update comprises a non-executable file to be transferred to the client computer, wherein the non-executable file comprises information, help or profile data.

33. The apparatus in claim **32** wherein the processor, in response to the stored instructions, displays the non-executable file, once transferred, to a user at the client computer.

* * * * *

39/3,K/13 (Item 13 from file: 350)
DIALOG(R)File 350:Derwent WPIX

0012890634
WPI ACC NO: 2002-750104/200281
Related WPI Acc No: 2001-357503; 2002-254659; 2002-479804; 2003-419904; 2003-689852; 2006-171217
XRPX Acc No: N2002-590776
Digital identifier based routing method for linking PC user to website, involves transferring scanned identifier **of physical object to an** indexing **system arranged** geographically **closer to user location**
Patent Assignee: DIGIMARC CORP (DIGI-N); HEIN W C (HEIN-I)
Inventor: HEIN W C
Patent Family (2 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	
US 20020120839	A1	20020829	US 2000257822	P	20001221	200281	B
			US 200132212	A	20011220		
US 6965683	B2	20051115	US 200132212	A	20011220	200579	E

Priority Applications (no., kind, date): US 2000257822 P 20001221; US 200132212 A 20011220

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing Notes
US 20020120839	A1	EN	3	0	Related to Provisional US 2000257822

Digital identifier based routing method for linking PC user to website, involves transferring scanned identifier **of physical object to an** indexing **system arranged** geographically **closer to user location**

Alerting Abstract ...ADVANTAGE - Improves reliability of service and reduces system response **time** .

Title Terms.../Index Terms/Additional Words: **GEOGRAPHICAL** ;

Class Codes
Manual Codes (EPI/S-X): **T01-N01D2** ...

... **T01-N02A3B** ...

... **T01-N02B1**

Original Publication Data by Authority

Original Abstracts:
A watermark **embedded** in a content (e.g., a printed document, digital audio, etc.) includes data that associates...

...a) the owner's name; (b) contact information; (c) license terms and conditions, (d) copyright **date** , (e) whether adult content is depicted, etc., etc. Or a magazine advertisement may contain an...

...several back-and-forth exchanges between the decoding device and the database. To speed response **time** , it is desirable that this traffic be exchanged with a database that is located close...

...A watermark **embedded** in a content (e.g., a printed document, digital audio, etc.) includes data that associates...

...a) the owner's name; (b) contact information; (c) license terms and conditions, (d) copyright **date** , (e) whether adult content is depicted, etc., etc. Or a magazine advertisement may contain an...

...several back-and-forth exchanges between the decoding device and the database. To speed response **time** , it is desirable that this traffic be exchanged with a database that is located close...

Claims:

...optical sensor;discerning from optical sensor data an identifier associated with the object;transferring the **identifier** to an **indexing** system; anddetermining from the indexing system an internet address corresponding to said object;an...

...to user locationat said master system, identifying an indexing system close to the user; **and** transferring said identifier **to** said identified indexing system...

...object to an optical sensor;discerning from optical sensor data an identifier associated with the **object** transferring the **identifier** to an indexing system; anddetermining from the indexing system an internet address corresponding to...

...information related to user locationat said master system, identifying an indexing system close to **the** user from plural **different** indexing systems; and **transferring** said identifier to said identified indexing system.

US 20020120839A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2002/0120839 A1

Hein, III (43) Pub. Date: Aug. 29, 2002

(54) ROUTING NETWORKS FOR USE WITH WATERMARK SYSTEMS

(76) Inventor: William C. Hein III, Glenmoore, PA (US)

Correspondence Address:
DIGIMARC CORPORATION
19801 SW 72ND AVENUE
SUITE 100
TUALATIN, OR 97062 (US)

(21) Appl. No.: 10/032,212

(22) Filed: Dec. 20, 2001

Related U.S. Application Data

(60) Provisional application No. 60/257,822, filed on Dec. 21, 2000.

Publication Classification

(51) Int. Cl.[7] H04L 9/00

(52) U.S. Cl. 713/153

(57) ABSTRACT

A watermark embedded in a content (e.g., a printed document, digital audio, etc.) includes data that associates the content with a remote store of related data. For example, an image watermark may contain an index value that identifies a database record specifying (a) the owner's name; (b) contact information; (c) license terms and conditions, (d) copyright date, (e) whether adult content is depicted, etc., etc. Or a magazine advertisement may contain an index value that identifies a database record specifying a related URL. Sometimes there are several back-and-forth exchanges between the decoding device and the database. To speed response time, it is desirable that this traffic be exchanged with a database that is located close—in network proximity—to the device that decodes the watermark. In one embodiment this is accomplished by first querying a master database with the zip code, or other identifier, of the decoding device. The first database then responds by identifying a second, nearby database with which further traffic should be exchanged.

[0016] The "master" router matches the country or postal code to the appropriate Digimarc MediaBridge Grand Central router—the one closest to the user and sends that reply back to the reader/detector application.

[0017] The reader/detector application now uses this supplied closest Digimarc MediaBridge Grand Central router for all future communications required to perform its ID to action association functions.

[0018] A simple 'hop' map currently might look like this

[0019] originating user in Glenmoore, Pa. 19343. Digimarc MediaBridge Grand Central router located in Tulsa, Okla.

[0020] Glenmoore to Paoli, Pa. (ISP dial in connection point)

[0021] to Philadelphia, Pa. (Internet "hub")

[0022] to Dallas, Tex. (Internet "hub")

[0023] to Tulsa, Okla. (Internet "hub")

[0024] to Digimarc Offices in Tulsa, Okla.

[0025] With a second Digimarc MediaBridge Grand Central router located in Philadelphia, the 'hop' map looks like

[0026] Glenmoore to Paoli, Pa. (ISP dial in connection point)

[0027] to Philadelphia, Pa. (Internet "hub")

[0028] to Philadelphia Digimarc MediaBridge Grand Central router

[0029] If the second Digimarc MediaBridge Grand Central router is located in New York, N.Y., the 'hop' map looks like

[0030] Glenmoore to Paoli, Pa. (ISP dial in connection point)

[0031] to Philadelphia, Pa. (Internet "hub")

[0032] to NY, N.Y. (Internet "hub")

[0033] to NY Digimarc MediaBridge Grand Central router

[0034] Application Ser. No. 09/571,422 also disclosed methods for handling watermark-based requests from client applications based, e.g., on the watermark's "type" and "number."

[0035] In an enhanced system, the client application can specify a router/product handler, allowing the Back Office facility to better load balance versus the associated watermark registry database. The client application can do this by appending a router name/number to the basic URL it now uses to communicate with the Back Office. Each of these "type-specific" Back Office router/product handlers can be responsible for servicing a specific, smaller portion of the entire registry database, speeding up their performance and keeping the consumer's perceived response time short.

[0036] This enhancement can be in addition to the "geographic routing" feature detailed above.

[0037] To provide a comprehensive disclosure without unduly lengthening this specification, the patents and applications cited in this specification are incorporated herein by references.

[0038] Having described and illustrated the subject technologies with reference to illustrative embodiments, it should be recognized that the invention is not so limited. For example, while the illustrative embodiment employed digital watermarking technology, the same principles can be applied in other contexts, such as bar code-based systems. Systems for linking to computer resources based on bar code indicia are shown, e.g., in U.S. Pat. Nos. 6,314,457, 6,154,738, 6,108,656, and 5,913,210.

[0039] The implementation of the functionality described above (including watermark decoding) is straightforward to artisans in the field, and thus not further belabored here. Conventionally, such technology is implemented by suitable software, stored in long term memory (e.g., disk, ROM, etc.), and transferred to temporary memory (e.g., RAM) for execution on an associated CPU. In other implementations, the functionality can be achieved by dedicated hardware, or by a combination of hardware and software. Reprogrammable logic, including FPGAs, can advantageously be employed in certain implementations.

[0040] It should be recognized that the particular combinations of elements and features in the detailed embodiments are exemplary only; the interchanging and substitution of these teachings with other teachings in this and the incorporated-by-reference patents/applications are also contemplated.

[0041] In view of the wide variety of embodiments to which the principles and features discussed above can be applied, it should be apparent that the detailed embodiments are illustrative only and should not be taken as limiting the scope of the invention. Rather, I claim as my invention all such modifications as may come within the scope and spirit of the following claims and equivalents thereof.

I claim:

1. In a method that includes:

presenting a physical object to an optical sensor;

discerning from optical sensor data an identifier associated with the object;

transferring the identifier to an indexing system; and

determining from the indexing system an internet address corresponding to said object;

an improvement comprising:

sending user data to a master system, the user data providing information related to user location

at said master system, identifying an indexing system close to the user; and

transferring said identifier to said identified indexing system.

* * * * *

US006965683B2

(12) **United States Patent**
Hein, III

(10) **Patent No.: US 6,965,683 B2**
(45) **Date of Patent: Nov. 15, 2005**

(54) **ROUTING NETWORKS FOR USE WITH WATERMARK SYSTEMS**

(75) Inventor: **William C. Hein, III**, Glenmoore, PA (US)

(73) Assignee: **Digimarc Corporation**, Beaverton, OR (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 601 days.

(21) Appl. No.: **10/032,212**

(22) Filed: **Dec. 20, 2001**

(65) **Prior Publication Data**

US 2002/0120839 A1 Aug. 29, 2002

Related U.S. Application Data

(60) Provisional application No. 60/257,822, filed on Dec. 21, 2000.

(51) **Int. Cl.**[7] **H04K 1/00**
(52) **U.S. Cl.** **382/100**
(58) **Field of Search** 382/100, 232, 382/233; 380/51, 54; 713/167, 168, 176, 713/179, 200, 201; 715/501.1, 514, 515, 715/516; 705/50, 51, 54; 709/217, 229

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,444,779	A *	8/1995	Daniele	399/366
5,606,609	A *	2/1997	Houser et al.	713/179
5,901,224	A *	5/1999	Hecht	713/179
5,905,800	A	5/1999	Moskowitz et al.	
5,983,351	A *	11/1999	Glogau	713/201
5,987,127	A *	11/1999	Ikenoue et al.	358/401
6,006,332	A *	12/1999	Rabne et al.	713/201
6,119,143	A	9/2000	Dias et al.	
6,122,403	A	9/2000	Rhoads	
6,170,014	B1 *	1/2001	Darago et al.	709/229
6,233,684	B1 *	5/2001	Stefik et al.	713/176
6,243,480	B1 *	6/2001	Zhao et al.	382/100
6,249,226	B1	6/2001	Harrison et al.	
6,269,394	B1	7/2001	Kenner et al.	
6,289,450	B1 *	9/2001	Pensak et al.	713/167
6,377,986	B1	4/2002	Philyaw et al.	
6,466,329	B1	10/2002	Mukai	
6,491,217	B2	12/2002	Catan	
6,650,761	B1	11/2003	Rodriguez et al.	
6,701,369	B1	3/2004	Philyaw	
2001/0021916	A1	9/2001	Takai	
2001/0021978	A1	9/2001	Okayasu et al.	
2001/0044824	A1	11/2001	Hunter et al.	
2001/0051996	A1	12/2001	Cooper et al.	
2002/0032698	A1	3/2002	Cox	
2002/0059162	A1	5/2002	Shinoda et al.	
2002/0062382	A1	5/2002	Rhoads et al.	
2002/0075298	A1	6/2002	Schena et al.	
2002/0080271	A1	6/2002	Eveleens et al.	
2002/0152388	A1	10/2002	Linnartz et al.	
2002/0194480	A1	12/2002	Nagao	
2003/0083098	A1	5/2003	Yamazaki et al.	

FOREIGN PATENT DOCUMENTS

WO	WO01/15021	3/2001
WO	WO01/71517	9/2001
WO	WO01/73586	10/2001

OTHER PUBLICATIONS

Zhao, Jian "A WWW Service to Embed and Prove Digital Copyright Watermarks", Proc. of the Europena Conference on Multimedia Applications , Services and techniques, pp. 1-15, May 1996.*

* cited by examiner

Primary Examiner—Jose L. Couso
(74) *Attorney, Agent, or Firm*—Digimarc Corporation

(57) **ABSTRACT**

A watermark embedded in a content (e.g., a printed document, digital audio, etc.) includes data that associates the content with a remote store of related data. For example, an image watermark may contain an index value that identifies a database record specifying (a) the owner's name; (b) contact information; (c) license terms and conditions, (d) copyright date, (e) whether adult content is depicted, etc., etc. Or a magazine advertisement may contain an index value that identifies a database record specifying a related URL. Sometimes there are several back-and-forth exchanges between the decoding device and the database. To speed response time, it is desirable that this traffic be exchanged with a database that is located close—in network proximity—to the device that decodes the watermark. In one embodiment this is accomplished by first querying a master database with the zip code, or other identifier, of the decoding device. The first database then responds by identifying a second, nearby database with which further traffic should be exchanged.

7 Claims, No Drawings

A simple 'hop' map currently might look like this
originating user in Glenmoore, Pa. 19343. Digimarc MediaBridge Grand Central router located in Tulsa, Okla.
Glenmoore to Paoli, Pa. (ISP dial in connection point)
to Philadelphia, Pa. (Internet "hub")
to Dallas, Tex. (Internet "hub")
to Tulsa, Okla. (Internet "hub")
to Digimarc Offices in Tulsa, Okla.

With a second Digimarc MediaBridge Grand Central router located in Philadelphia, the 'hop' map looks like
Glenmoore to Paoli, Pa. (ISP dial in connection point)
to Philadelphia, Pa. (Internet "hub")
to Philadelphia Digimarc MediaBridge Grand Central router

If the second Digimarc MediaBridge Grand Central router is located in New York, N.Y., the 'hop' map looks like
Glenmoore to Paoli, Pa. (ISP dial in connection point)
to Philadelphia, Pa. (Internet "hub")
to New York, N.Y. (Internet "hub")
to NY Digimarc MediaBridge Grand Central router

Application Ser. No. 09/571,422 also disclosed methods for handling watermark-based requests from client applications based, e.g., on the watermark's "type" and "number."

In an enhanced system, the client application can specify a router/product handler, allowing the Back Office facility to better load balance versus the associated watermark registry database. The client application can do this by appending a router name/number to the basic URL it now uses to communicate with the Back Office. Each of these "type-specific" Back Office router/product handlers can be responsible for servicing a specific, smaller portion of the entire registry database, speeding up their performance and keeping the consumer's perceived response time short.

This enhancement can be in addition to the "geographic routing" feature detailed above.

To provide a comprehensive disclosure without unduly lengthening this specification, the patents and applications cited in this specification are incorporated herein by references.

Having described and illustrated the subject technologies with reference to illustrative embodiments, it should be recognized that the invention is not so limited. For example, while the illustrative embodiment employed digital watermarking technology, the same principles can be applied in other contexts, such as bar code-based systems. Systems for linking to computer resources based on bar code indicia are shown, e.g., in U.S. Pat. Nos. 6,314,457, 6,154,738, 6,108,656, and 5,913,210.

The implementation of the functionality described above (including watermark decoding) is straightforward to artisans in the field, and thus not further belabored here. Conventionally, such technology is implemented by suitable software, stored in long term memory (e.g., disk, ROM, etc.), and transferred to temporary memory (e.g., RAM) for execution on an associated CPU. In other implementations, the functionality can be achieved by dedicated hardware, or by a combination of hardware and software. Reprogrammable logic, including FPGAs, can advantageously be employed in certain implementations.

It should be recognized that the particular combinations of elements and features in the detailed embodiments are exemplary only; the interchanging and substitution of these teachings with other teachings in this and the incorporated-by-reference patents/applications are also contemplated.

In view of the wide variety of embodiments to which the principles and features discussed above can be applied, it should be apparent that the detailed embodiments are illustrative only and should not be taken as limiting the scope of the invention. Rather, I claim as my invention all such modifications as may come within the scope and spirit of the following claims and equivalents thereof.

I claim:

1. In a method that includes:
presenting a physical object to an optical sensor;
discerning from optical sensor data an identifier associated with the object;
transferring the identifier to an indexing system; and
determining from the indexing system an internet address corresponding to said object;
an improvement comprising:
sending user data to a master system, the user data providing information related to user location
at said master system, identifying an indexing system close to the user from plural different indexing systems; and
transferring said identifier to said identified indexing system.

2. The method of claim 1 wherein the user data comprises a postal code.

3. The method of claim 1 wherein the user data comprises a country identifier.

4. The method of claim 1 wherein the user data also comprises object type data, and said identifying comprises identifying the indexing system as a function of both the user location and the object type data.

5. The method of claim 1 wherein said physical object comprises a printed substrate.

6. A routing method for use by a router in an object-to-web linking system, comprising:
receiving an object identifier sent from a client device, said identifier corresponding to a physical object presented to said client device;
receiving a location identifier sent from a client device and identifying a location of said device;
by reference to at least said location identifier, determining an address of an object-related database system remote from said router, from several possible such database systems; and
transferring said object identifier to said determined database system.

7. The method of claim 6 that further includes:
receiving an object type identifier from the client device; and
determining said address by reference to at least said location data and said object type identifier.

* * * * *

39/3,K/22 (Item 22 from file: 350)
DIALOG(R)File 350:Derwent WPIX

0012265371 - Drawing available
WPI ACC NO: 2002-205575/200226
XRPX Acc No: N2002-156548
Spatial context system for data and telecommunications network, has spatial location determiner, user interface for selecting spatial region **and database for associating event with spatial** region
Patent Assignee: LIMING R (LIMI-I)
Inventor: LIMING R
Patent Family (3 patents, 92 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	
WO 2001054021	A1	20010726	WO 2001US1535	A	20010118	200226	B
AU 200130955	A	20010731	AU 200130955	A	20010118	200226	E
US 20020055924	A1	20020509	US 2000176489	P	20000118	200235	E
			US 2001761649	A	20010118		

Priority Applications (no., kind, date): US 2001761649 A 20010118; US 2000176489 P 20000118

Sort / Ranking
CLAIM 22

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing Notes
WO 2001054021	A1	EN	75	15	

National Designated States,Original: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
Regional Designated States,Original: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

AU 200130955	A	EN		Based on OPI patent WO 2001054021
US 20020055924	A1	EN		Related to Provisional US 2000176489

...**system for data and telecommunications network, has spatial location determiner, user interface for selecting spatial** region **and database for associating event with spatial** region

Alerting Abstract ...a spatial location determiner (108), a user interface (104) that allows selection of a spatial **region** , and a database (112) or other means of associating an event with a spatial location or spatial **region** . ...storage and transfer of spatial location associated with a given waypoint; and the creation of **geographic** network maps...

...telephone systems, by associating unique identifiers with spatial locations. Uses spatial context to enhance current **classification** , search, automation and **directory organization** systems. Assigns unique **identifier** to point of sale terminals or other equipment owned by a business or other entity...

...locations. Easily guides user to a given business, government office or other desired location. Provides **incorporation** of maps relevant to location contexts by **incorporating** a network accessible map service. Automatically configures desired spatially relevant services or information
...

Title Terms.../Index Terms/Additional Words: **REGION** ;

Class Codes
International Classification (Main): **G06F-017/60** ...

... **G06F-007/00**
Manual Codes (EPI/S-X): **T01-H07C5E** ...

... **T01-J05A2** ...

... **T01-J05B2** ...

... **T01-J05B4P** ...

... **T01-J12B1**

Original Publication Data by Authority

Original Abstracts:
...context. Such spatial location contexts form the foundation for location-enabled systems and transactions by **integrating** an extensible plurality of spatial and **time** reference systems and encodings; an accurate and precise metadata model; persistent identification; and a flexible...

...such location-enabled systems and transactions to create methods and systems for automation, transaction processing, **integration** , and exchange of spatially relevant information over a communications network like the Internet...

...Such spatial location contexts form the foundation for location-enabled systems (108) and transactions by **integrating** an extensible plurality of spatial and **time** reference systems and encodings; an accurate and precise metadata model; persistent identification; and a flexible...

...location-enabled systems (108) and transactions to create methods and systems for automation, transaction processing, **integration** , and exchange of spatially relevant information over a communications network like the Internet (202...

...de la creation de procedes et de systemes d'automatisation, de traitement des transactions, d' **integration** et d'echange d'informations spatialement pertinentes via un reseau de communication tel que l...
Claims:
...creating graphical network maps, comprising the steps of:determining the spatial location of a device; **embedding** said device spatial location in data transmitted from said device;determining spatial locations of at...

...device spatial locations; and,receiving said modified packet and extracting said spatial locations; andillustrating **said** geographic locations on a map or by other graphical means.

US 20020055924A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2002/0055924 A1

Liming (43) Pub. Date: May 9, 2002

(54) SYSTEM AND METHOD PROVIDING A SPATIAL LOCATION CONTEXT

(76) Inventor: Richard Liming, Alexandria, VA (US)

Correspondence Address:
GREENBERG-TRAURIG
1750 TYSONS BOULEVARD, 12TH FLOOR
MCLEAN, VA 22102 (US)

(21) Appl. No.: 09/761,649

(22) Filed: Jan. 18, 2001

Related U.S. Application Data

(63) Non-provisional of provisional application No. 60/176,489, filed on Jan. 18, 2000.

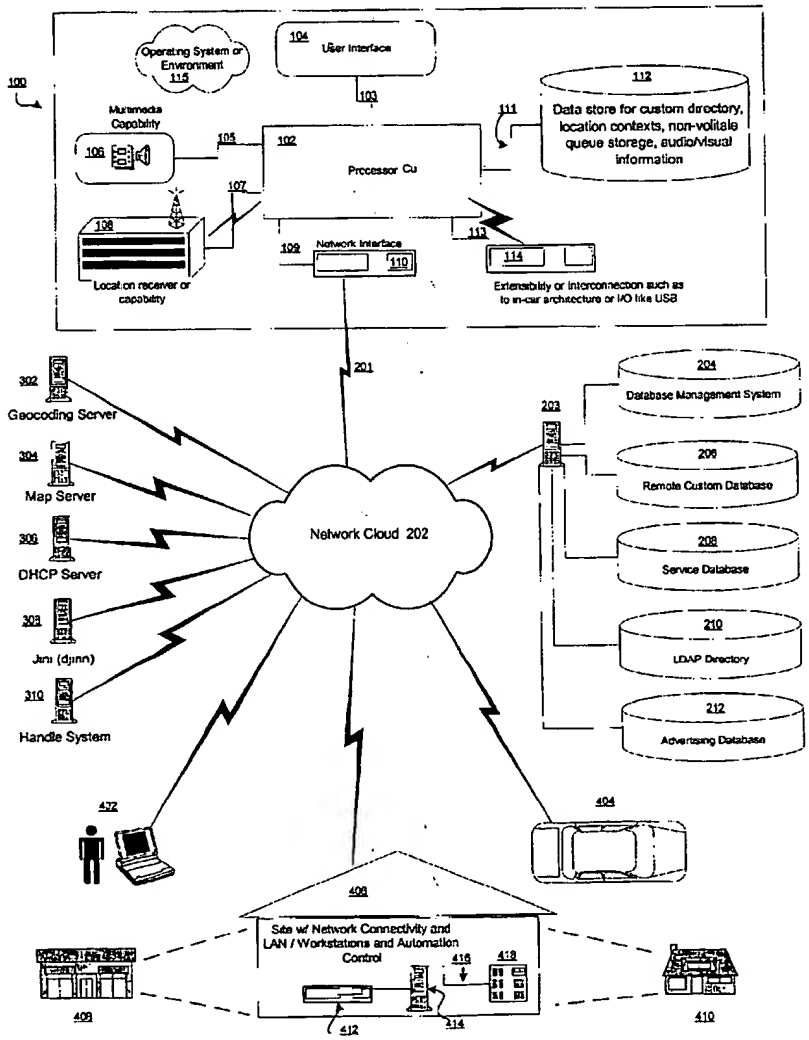
Publication Classification

(51) Int. Cl.[7] G06F 7/00

(52) U.S. Cl. 707/100

(57) ABSTRACT

A software and hardware architecture operating across a local or wide area network providing an integral spatial location context. Such spatial location contexts form the foundation for location-enabled systems and transactions by integrating an extensible plurality of spatial and time reference systems and encodings; an accurate and precise metadata model; persistent identification; and a flexible digital security model. This application also teaches the use of such location-enabled systems and transactions to create methods and systems for automation, transaction processing, integration, and exchange of spatially relevant information over a communications network like the Internet.



IP_Address	Latitude	Longitude	Created
63.20.247.227	38.4986	77.0876	Feb 6 2000 5:50PM
63.20.247.227	38.4986	77.0874	Feb 6 2000 5:52PM
63.21.58.221	38.4986	77.0873	Feb 6 2000 11:30PM
63.13.89.185	38.4984	77.0877	Feb 11 2000 10:50AM
63.15.231.53	38.4987	77.0885	Feb 11 2000 4:02PM
151.200.100.4	38.4985	77.0874	Feb 11 2000 9:11PM
151.200.100.4	38.4982	77.0877	Feb 12 2000 2:22AM
151.200.100.4	38.4983	77.0875	Feb 12 2000 3:14AM

Figure 5

ID	Service Context	Service ProviderID	Local or Remote	MIME type	Dimensions	Lat1	Lon1	Lat2	Lon2	Location
00400	4321	1000	R	audio/mpe	1 min	38 91	-77.2	39.01	-77.3	https://adserv.acmebank.com/ads.cgi?id=30
00401	2234	1001	L	image/png	200x300	39.91	-77.3	39.99	-77.4	/ad/local/images/403A69.png
00402	101	1000	.		.	.	.	.	.	

Figure 6

Lat1	Lat2	Lon1	Lon2	Type	TimeContext	ItemID	DeviceID or Location
32.77754	33.12455	-77.1242	-77.2275	Audio		/q/audioq/A5F339	151.22.122.40:7900
32.12421	33:14241	-77.1242	-77.2275	Control	1600-0500,M-F	q/cntrlq/87ACEF	06:43:53:09:04

Figure 7

SERVICEID	LATITUDE	LONGITUDE	CLASS	SUBCLASS	TIMECONSTRAINT	SERVICEPROVIDERID
123456789	38 92319	-77.222517	1.3.4.5.7	5.7	0 11 4 * mon-wed	1000
123456790	38.91606	-77.237926	1.3.4.5.100	8.4	10 6 * * *	1000
123456791	38.90663	-77.229219	1000	45	0 */2 * * *	1.3.100.2
123456792	38.85912	-77.224644	2000	55	0 23-7/2,8 * * *	1.3.100.3

Figure 8

```
<html>
<body>
<table>
<tr>
<th>street</th>
<th>city</th>
<th>state</th>
<tr>
<td>1234 Albemarle Street</td>
<td>Alexandria</th>
<td>VA</th>
<tr>
</table>
</body>
</html>
```

[0223] From which it can be seen that the tags do not describe the content, but merely there position in a table, thus making it hard to rely on such a method for the accurate determination of the content and thus ability to make use of it in a sophisticated, automated fashion.

[0224] In a spatial scenario even basic XML could be used to begin to describe spatially relevant information such as with:

```
<spatialObject>
<objectType>
machine
<objectType>
<spatialCoordinates method=latlon>
<latitude>39.354</latitude>
<longitude>-77.50</longitude>
</spatialCoordiates>
</spatialObject>
```

[0225] In this case, a system could easily extract important information about the listed object, such as its location. In practice this is not a great design. However it is used here for general illustrative purpose.

[0226] It is an aspect of preferred embodiment to incorporate such mechanisms, such as the definition of a spatialXML, and/or a geobookmarkXML to increase the cross functional, cross system use and automation of systems designed for, or with a need to make use of spatial information.

[0227] Accurate time keeping and time systems are an integral part of systems that determine and use spatial location. In a pure technical sense, time determines place. All spatial reference systems are closely related to precision time methods, and there are a number of time references including the deprecated Greenwich Mean Time (GMT), its replacement Universal Coordinated Time ("UTC"), UT or UT1, UT2. and many others which are described briefly on the U.S. Naval Observatory Site (http://tycho.usno.navy.mil/systime.html).

[0228] In any case, it is an aspect of the present invention to support a plurality of spatial systems, which means that in some scenarios it is worthwhile to support the of an accurate time reference model. Additionally, there are other common beneficial uses for reasonably accurate time related to any robust system.

[0229] Fortunately there is an accurate network time keeping and coordination method called simply Network Time Protocol (NTP) as described in RFC1305 and implemented in readily available software and publicly and privately available systems with accurate time references, like stratum 1 time sources as described in the RFC. NTP includes sophisticated means for accounting for factors such as network delay when transmitting and coordinating time between systems.

[0230] It is aspect of a preferred embodiment to support a plurality of time reference systems and to incorporate accurate time mechanisms which may including systems with attached hardware such as time signal receivers, like GPS receivers, and network time methods such as NTP where applicable.

[0231] Many aspects and benefits of the present invention can be realized without such time references, however there are aspects and applications that benefit from such capabilities.

[0232] It is a common feature on most systems with a UNIX based operating system to include a functionality called cron or cron jobs. A preferred embodiment of the present invention may incorporate time constraints in conjunction with location contexts and automation such as reminders and remote control.

[0233] This cron method is used to illustrate a method that may be used in a preferred embodiment for specifying such time constraints, and to aid in the description of how such scheduling may be accomplished, yet it is not intended to limit the invention to this method.

[0234] A crontab file or table consists of lines of six fields each. The fields are separated by spaces or tabs. The first five are integer patterns that specify the following: minute (0-59), hour (0-23), day of the month (1-31), month of the year (1-12), day of the week (0-6 with 0=Sunday).

[0235] The sixth field of a line in a crontab file is a string which is usually a command that is executed by the operating system. In these examples, the string is the word 'date' which can be ignored, as this particular discussion is merely meant to illustrate a method for specifying scheduling or time constraints.

[0236] Some typical cron table entries.

[0237] # MIN HOUR DAY MONTH DAYOFWEEK COMMAND

[0238] # at 6:10 a.m. every day

[0239] 10 6***date

[0240] # every two hours at the top of the hour

[0241] 0*/2***date

[0242] # every two hours from 11:00 p.m. to 7:00 a.m., and at 8:00 a.m.

[0243] 0 23-7/2,8***date

1. A method of creating graphical network maps, comprising the steps of:

determining the spatial location of a device;

embedding said device spatial location in data transmitted from said device;

determining spatial locations of at least one network device through which said data passes;

modifying packet information associated with said data to include said network device spatial locations; and,

receiving said modified packet and extracting said spatial locations; and

illustrating said geographic locations on a map or by other graphical means.

2. A spatial information transmission method for use within and between electronic devices, comprising the steps of:

obtaining an automatically determined spatial location from an electronic device when said electronic device is capable of such determination;

obtaining a spatial location from a user when said electronic device is not capable of automatic spatial location determination and said stored spatial location is not available from said electronic device; and

embedding at least one of said spatial locations in communications originating from said electronic device.

3. The spatial information transmission method of claim 2, further comprising the step of obtaining a stored spatial location from said electronic device when said electronic device is not capable of automatic spatial location determination;

4. The spatial information transmission method of claim 2, further comprising the step of storing at least one of said spatial locations, wherein said at least one stored spatial location is made available to a plurality of requesters.

5. The spatial information transmission method of claim 2, wherein said spatial locations include spatial location information and spatial location attributes.

6. The spatial information transmission method of claim 2, wherein said spatial location is embedded using Multipurpose Internet Mail Extensions.

7. The spatial information transmission method of claim 2, wherein said spatial location is included in object identifiers in a Simple Network Management Protocol management information base.

8. The spatial information transmission method of claim 2, wherein said spatial location is included as a Lightweight Directory Access Protocol object.

9. The spatial information transmission method of claim 2, wherein said spatial location is embedded within the header of a standard Advanced Research Projects Agency Internet Text Message.

10. The spatial information transmission method of claim 2, further comprising the step of encoding said spatial location based on an Extensible Markup Language Document Type Definition.

11. A spatial location based reminder method, comprising the steps of:

storing content;

defining a spatial region;

allowing a user to associate said spatial region with said content;

determining a current spatial location of an electronic device; and

presenting content associated with a spatial area to a user when said device is within said spatial region.

12. The spatial location based reminder method of claim 11, in which said electronic device performs said step of determining said current spatial location.

13. The spatial location based reminder method of claim 11, in which said spatial region is defined by a spatial location occupied by the device on which said association is created, wherein said spatial region is determined by associating a range with said spatial location.

14. The spatial location based reminder method of claim 11, in which said content is stored on at least one server communicatively coupled to said electronic device.

15. The spatial location based reminder method of claim 11, in which said defined spatial regions are stored on at least one server communicatively coupled to said electronic device.

16. The spatial location based reminder method of claim 11, in which said spatial region and content associations are stored on at least one server communicatively coupled to said electronic device.

17. A spatial location based control method, comprising the steps of:

creating a command to control a device or system;

defining a spatial region;

associating said spatial region with said device or system control command;

determining a current spatial location of a mobile electronic device; and

sending the device or system control command associated with a spatial region to a device when said mobile electronic device is within said spatial region.

18. The spatial location based control method of claim 17, in which said device or system control command is sent when said mobile electronic device enters said spatial region.

19. The spatial location based control method of claim 17, further comprising the steps of:

associating scheduling information with said spatial region and control command associations; and,

restricting the sending of device or system control commands associated with said spatial region to dates and times corresponding to said schedule information.

20. The spatial location based control method of claim 17, in which said mobile electronic device determines its current spatial location.

21. The spatial location based control method of claim 20, in which said spatial region definition step further comprises activating a user interface element on said electronic device which causes a spatial location to be recorded and associated with a range to create said spatial region.

22. A spatial location based information display and control system which includes a means for defining a user selectable hierarchy of one or more preferred location determination means, wherein said user selectable hierarchy allows users of said spatial location based information display and control system to record spatial locations of interest using a variety of spatial location specification means.

23. A spatial location based content substitution method, comprising the steps of:

storing content in a database;

storing attributes of said content in said database;

associating said content with one or more spatial locations;

storing said associations in a database;

determining the current spatial location of a content presentation device;

selecting content from said database based on said content presentation device current location and content attributes; and,

presenting said content to a user of said content presentation device in place of default content.

24. The spatial location based content substitution method of claim 23, further comprising the step of selecting content from said database based on a current date and time, and user behavior patterns.

25. The spatial location based content substitution method of claim 24, in which said behavior patterns include the duration a user typically stays within a spatial region, and the frequency with which a user visits a given spatial region.

26. The spatial location based content substitution method of claim 23, in which said content attributes include content duration and content target audience.

27. The spatial location based content substitution method of claim 26, in which demographic information relating to a user or owner of said content presentation device is stored in a database, and wherein such demographic information is used in combination with other criteria when selecting content from said database.

28. The spatial location based content substitution method of claim 23, in which said content and said default content includes advertisements.

29. The spatial location based content substitution method of claim 23, in which the step of selecting content from said database includes selection of one or more content pieces whose aggregate dimensions are substantially equal to said default content.

30. A spatial location transmission method, comprising the steps of:

determining a spatial location of interest;

determining spatial location attributes;

translating said spatial location of interest and spatial location attributes into at least one standardized format; and

embedding said translated spatial location into at least one communications protocol component.

31. The spatial location transmission method of claim 30, in which said communications protocol components comprise communications protocol headers.

32. The spatial location transmission method of claim 31, in which said embedded, translated spatial locations are transmitted as part of all data transmitted by a device.

33. The spatial location transmission method of claim 30, in which said at least one communications protocol is comprised of at least one message transfer protocol.

34. The spatial location transmission method of claim 30, in which said spatial location of interest comprises the current spatial location of a device.

35. The spatial location transmission method of claim 34, in which said current spatial location of a device is determined automatically.

36. The spatial location transmission method of claim 30, in which said spatial location attributes utilize the Content Standard for Digital Geospatial Metadata as said standardized format.

37. The spatial location transmission method of claim 30, in which said standardized format is enhanced to use a standardized vocabulary, thereby facilitating additional automation.

38. The spatial location transmission method of claim 30, in which additional translated spatial locations indicating the current spatial location of network components devices said data transmitted by a device are embedded by said network components into said data.

39. The spatial location transmission method of claim 30, further comprising a step of maintaining a database of previous and current spatial locations for various devices, thereby enhancing asset management capabilities.

40. A spatial location based data validation system, comprising:

a transmitting device capable of automatic spatial location determination;

a receiving device capable of receiving a spatial location;

a database of recent transmitting device spatial locations;

a means of calculating a speed and direction of said transmitting device based on said database of recent transmitting device spatial locations; and

a means of determining whether a most recently received transmitting device spatial location is consistent with said calculated speed and direction, within a specified range.

41. A spatial location based data validation method, comprising the steps of:

determining the current spatial location of a transmitting device;

transmitting said transmitting device current location to a receiving device along with other data from said transmitting device;

receiving said transmitting device current spatial location;

storing said transmitting device current spatial location;

calculating the speed and direction of travel associated with said transmitting device based on recently stored current spatial locations for a transmitting device;

determining whether said transmitting device current location is consistent with said calculated transmitting device speed and direction of travel, within a customizable error limit; and

providing positive authentication to said other data from said transmitting device if said transmitting device current spatial location is determined to be consistent with said calculated transmitting device speed and direction of travel.

42. An automatic spatial location client configuration and service location system, comprising:

a device capable of transmitting a configuration request and receiving local configuration information;

a storage means on said device into which said local configuration information can be stored;

at least one server capable of fulfilling computing services; and

at least one master server capable of maintaining a list of currently available services provided by said at least one server, spatial locations associated with said at least one server and said device, and spatial locations served by said at least one server.

43. The automatic spatial location client configuration and service location system of claim 42, wherein said device includes a current spatial location in said configuration request.

44. The automatic spatial location client configuration and service location system of claim 42, wherein said local configuration information received by said device includes a spatial location.

45. The automatic spatial location client configuration and service location system of claim 42, wherein said local configuration information includes software to be installed on said device.

46. The automatic spatial location client configuration and service location system of claim 42, wherein said local configuration information includes specification of a preferred spatial location encoding means and software necessary to implement said preferred spatial location encoding means if said device is not already capable of implementing said preferred spatial location encoding means.

47. An automated network client configuration and service location method, comprising the steps of:

transmitting a configuration request from a device;

receiving and processing said configuration request at a master configuration server;

identifying at least one server capable of providing said requested configuration information to said device based in part on said spatial location transmitted by said device;

rerouting of said configuration request to said at least one service server;

transmitting said requested configuration information to said device from said at least one service server; and

storing said requested configuration information on said device.

48. The automated network client configuration and service location method of claim 47, in which said configuration request includes a spatial location, attributes associated with said spatial location, and attributes associated with said device

49. The automated network client configuration and service location method of claim 47, in which said requested configuration information includes a list of additional services available from at least one server accessible via the network.

50. The automated network client configuration and service location method of claim 47, in which said device is capable of automatically determining a current spatial location, and said current spatial location is included in said configuration information request.

51. A real time, spatial location aware directory system, comprising:

an electronic device which is assigned a unique identifier, and which is capable of reporting a spatial location by embedding said spatial location, said unique identifier, and other information within communications originating from said electronic device;

network infrastructure equipment capable of extracting said spatial location and said unique identifier from said communications originating from said electronic device;

a database communicatively coupled to said network infrastructure equipment which is capable of associating said extracted electronic device identifier and spatial location with information pertaining to an entity owning and operating said electronic device; and

a means of updating spatial location information stored in said database when spatial location information reported by said electronic device changes.

52. The real time, spatial location aware directory system of claim 51, wherein said electronic device includes a point of sale terminal.

53. The real time, spatial location aware directory system of claim 51, wherein said information pertaining to an entity owning and operating said electronic device includes the name, address, telephone number, and E-mail address of said entity, wherein said address is updated as said spatial location information reported by said electronic device changes.

54. A method of maintaining a real time, spatial location aware directory which comprises the steps of:

embedding at least one spatial location and attributes associated with an electronic device in communications originating from said electronic device;

monitoring said communications and extracting said spatial location and attributes;

storing said extracted spatial location and attribute information in a database of entities owning said electronic devices, along with additional information provided by said entities; and,

updating said database when said spatial location associated with said electronic device changes.

55. The real time spatial location aware directory maintenance method of claim 54, in which said electronic device is a point of sale terminal.

56. The real time spatial location aware directory maintenance method of claim 54, in which said additional information includes the name, address, telephone number, and E-mail address of said entity, wherein said address is updated as said spatial location associated with said electronic device changes.

57. A method of storing a spatial location associated with a given waypoint, comprising:

determining a spatial location;

translating said spatial location into at least one standardized format; and

storing said translated spatial location as a cookie.

58. A method of building an enhanced directory of available services and devices which includes the spatial location of such services and devices, comprising the steps of:

transmitting a configuration request from a device, wherein said configuration request includes a spatial location, attributes associated with said spatial location, and attributes associated with said device;

receiving and processing said configuration request at a master configuration server;

identifying at least one service servers capable of providing said requested configuration information to said device based in part on said spatial location transmitted by said device;

rerouting of said configuration request to said one or more service servers;

transmitting said requested configuration information to said device from said one or more service servers;

storing said requested configuration information on said device.

storing said spatial location, spatial location attributes, device attributes, and assigned configuration information in a database on a server;

allowing other devices to search said database; and,

updating device spatial location and spatial location attribute information on a periodic basis.

* * * * *

39/3,K/7 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX

0013800819 - Drawing available
WPI ACC NO: 2003-900917/200382
XRPX Acc No: N2003-719296
Object identifier system used in e-commerce environment, has identification generator that generates identifier which includes, in encoded format, location and time information provided by GPS receiver
Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)
Inventor: CHENG T D
Patent Family (1 patents, 1 countries)

Patent			Application			
Number	Kind	Date	Number	Kind	Date	Update
US 20030206133	A1	20031106	US 2001862732	A	20010522	200382 B

Priority Applications (no., kind, date): US 2001862732 A 20010522

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing Notes
US 20030206133	A1	EN	7	2	

...**commerce environment, has identification generator that generates identifier which includes, in encoded format, location and** time **information provided by** GPS **receiver**

Alerting Abstract ...NOVELTY - The object identifier system (10) includes a **global positioning** system (**GPS**) receiver (12) for providing location and **time** information, an identification generator that generates an identifier which includes the provided location and **time** information in an encoded format, and an object **tagging** system for assigning the identifier to an object (20,22,24) located proximate the **GPS** receiver.... USE - For providing unique **identifiers** to objects, such as hardware, **files** , data, software, e-mail messages and events, in e-commerce environment...

...ADVANTAGE - Provides system for generating unique and persistent identifiers using information obtained from a **GPS** .
...

...12 **GPS** receiver

Title Terms.../Index Terms/Additional Words: **TIME** ;

Class Codes
Manual Codes (EPI/S-X): **T01-D02** ...
... **T01-N01A2** ...

... **T01-N01C**

Original Publication Data by Authority

Original Abstracts:
...identification system for providing unique identifiers for objects, wherein the identification system obtains location and **time** information

from a **global positioning** system (**GPS**) and encodes the location and **time** information into each unique identifier; and an application for processing the objects, wherein the application...

Claims:

b 1 /b . A system for assigning object identifiers, comprising:a **global positioning** system (**GPS**) receiver for providing location and **time** information;an identification generator that generates an identifier, wherein the identifier includes the provided location and **time** information in an encoded format; anda system for assigning the identifier to an object located proximate **the** GPS receiver.

US 20030206133A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2003/0206133 A1

Cheng (43) Pub. Date: Nov. 6, 2003

(54) GEOCHRONICLE BASED IDENTIFICATION FOR E-BUSINESS

(75) Inventor: Ting Dean Cheng, Mahopac, NY (US)

Correspondence Address:
HOFFMAN WARNICK & D'ALESSANDRO, LLC
3 E-COMM SQUARE
ALBANY, NY 12207

(73) Assignee: International Business Machines Corporation, Armonk, NY (US)

(21) Appl. No.: 09/862,732

(22) Filed: May 22, 2001

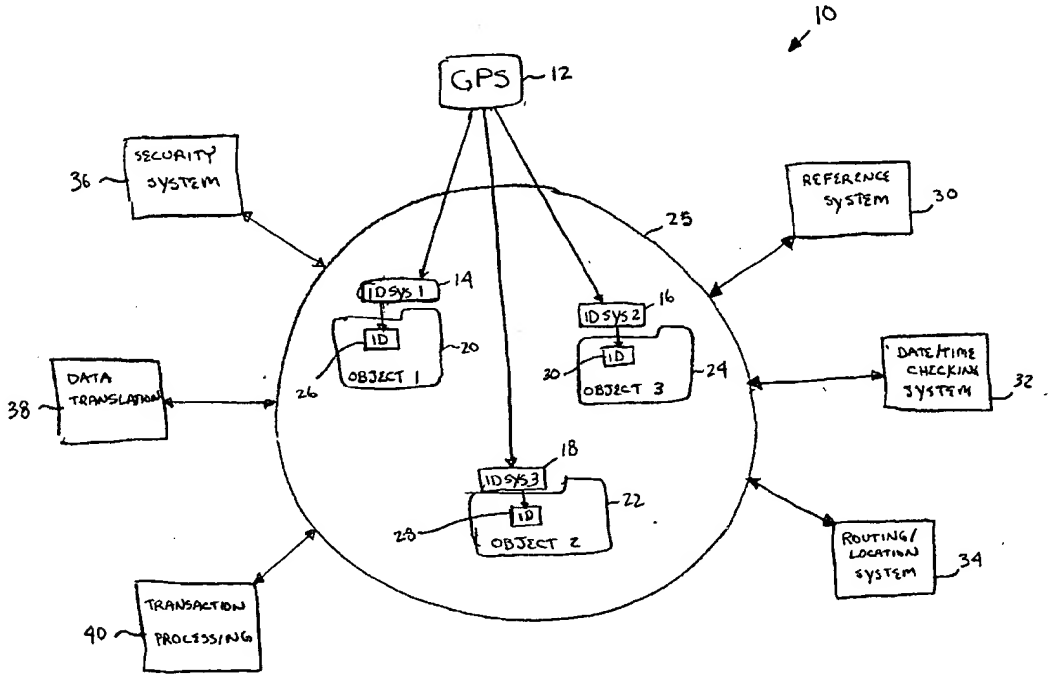
Publication Classification

(51) Int. Cl.[7] G01S 5/14

(52) U.S. Cl. 342/357.06

(57) ABSTRACT

A method and system for generating and processing object identifiers in an e-commerce environment. The system comprises a database for holding objects; at least one identification system for providing unique identifiers for objects, wherein the identification system obtains location and time information from a global positioning system (GPS) and encodes the location and time information into each unique identifier; and an application for processing the objects, wherein the application includes a system for processing the unique identifier.



tion events and calculate a time and location difference. If the time and location differences exceeded a threshold, a security flag could be raised.

[0027] Data translation system **38** could provide an application in which the time and location information encoded in the ID of an object could be translated into useful, i.e., human understandable, information. For example, the translated information could automatically be used for time, date and location reference in filling out forms, tables, envelopes, etc. Thus, if a police office was filling out an electronic accident report, a report object could be created with an assigned ID. The ID could be used to automatically fill in the time and location information of the report.

[0028] Transaction processing system **40** could be used for any system that involves transactions, including a scheme for generating temporary identifications to be used for a single, or a limited number of transactions, such as found in many online transaction processing schemes. For instance, in order to efficiently implement such a system, it is necessary to ensure that dynamically generated temporary ID's are unique, particularly in the case where there is a high volume of transactions (e.g., a telephone voucher code system that allows a user to receive free calling time by entering a code that contains an ID). The present invention ensures the necessary uniqueness, and allows transaction processing system **40** to accurately validate each transaction (e.g., ensure that a specific telephone voucher code is valid and has sufficient credit to place a call).

[0029] Referring now to **FIG. 2**, a more detailed view of ID system **14** of **FIG. 1** is shown. ID system **14** provides the mechanisms for generating an ID for an object (not shown) located proximate GPS receiver **42**. In operation, GPS receiver **42** receives GPS signals from GPS **12**, and calculates time and location information. The time and location information is then communicated to an ID processing system **50**. ID processing system **50** may include a processor **52**, an input/output **54** and a memory **48**. Residing in memory **48** is a software program, ID generator **44**, which takes the time and location information from GPS receiver **42** and encodes it into an ID. ID processing system **50** may be physically located with the receiver, or be located remotely. For example, ID processing system **50** could be accessed over a network, such as the Internet, so that the encoding of ID's could be uniformly effectuated at a central location.

[0030] Once created, the ID is then forwarded to an object tagging system **60**, which tags or associates the ID with an object. Object tagging system **60** converts the ID into a format suitable for tagging the object located proximate GPS receiver **42**. For example, a tagging format may include physical in formation (e.g., a bar code ID sticker) attachable to an object; an electronic ID that can be inserted into a data record or database; or a data pointer that points to the ID; etc. Object tagging system **60** may comprise, or have access to one or more databases for storing ID and object information. In the case where a physical tag is being applied to an object, tagging is preferably done proximate GPS receiver **42**, so that object's location is accurately reflected in the encoded ID. In the case where tagging involves, for example, an electronic ID stored in a database, tagging need not occur proximate the receiver. Rather, the ID can be stored, or tagged, in a remote database that includes information about the object. It should also be appreciated that object tagging system **60**, as well as portions of GPS receiver **42**, could exist as part of a common software program (or program product) with ID generator **44**.

[0031] Also included in memory **48** is a multi-event processor **56**. Multi-event processor **56** handles the case when more than one event occurs at the same location and time (i.e., a common point within the four dimensional grid). In this case, further variations of the ID would be derived by special algorithms that may, for example, read from a clock with a higher resolution to achieve the goal of assigning unique ID's to every object. Alternatively, additional data could be added to each ID to distinguish them (e.g., ID1, ID2, ID3 . . .).

[0032] It is understood that the components of the present invention can be realized in hardware, software, or a combination of hardware and software. Any kind of computer system—or other apparatus adapted for carrying out the methods described herein—is suited. A typical combination of hardware and software could be a general purpose computer system with a computer program that, when loaded and executed, carries out the methods described herein. Alternatively, a specific use computer, containing specialized hardware for carrying out one or more of the functional tasks of the invention could be utilized. Aspects of the present invention can also be embedded in a computer program product, which comprises all the features enabling the implementation of the methods described herein, and which—when loaded in a computer system—is able to carry out these methods. Computer program, software program, program, module, mechanism or software, in the present context mean any expression, in any language, code or notation, of a set of instructions intended to cause a system having an information processing capability to perform a particular function either directly or after either or both of the following: (a) conversion to another language, code or notation; and/or (b) reproduction in a different material form.

[0033] The foregoing description of the preferred embodiments of this invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed, and obviously, many modifications and variations are possible. Such modifications and variations that may be apparent to a person skilled in the art are intended to be included within the scope of this invention as defined by the accompanying claims.

1. A system for assigning object identifiers, comprising:

a global positioning system (GPS) receiver for providing location and time information;

an identification generator that generates an identifier, wherein the identifier includes the provided location and time information in an encoded format; and

a system for assigning the identifier to an object located proximate the GPS receiver.

2. The system of claim 1, wherein the location information includes three dimensional information.

3. The system of claim 1, wherein the object and assigned identifier are stored in a database with similar objects and their respective assigned identifiers.

4. The system of claim 1, wherein the identification generator is located remotely from the GPS receiver.

5. The system of claim 1, wherein the identification generator is located locally to the GPS receiver.

6. A program product stored on a recordable medium for assigning object identifiers, the program product comprising:

means for receiving location and time information from a global positioning system (GPS) receiver;

means for generating an identifier, wherein the identifier includes the received location and time information in an encoded format; and

means for outputting the identifier in a format suitable for tagging an object located proximate the GPS receiver.

7. The program product of claim 6, further comprising means for processing simultaneous events that occur at a common location.

8. The program product of claim 6, further comprising database means for storing the identifier.

9. A system for processing object identifiers in an e-commerce environment, comprising:

a database for holding objects;

at least one identification system for providing unique identifiers for objects, wherein the identification system obtains location and time information from a global positioning system (GPS) and encodes the location and time information into each unique identifier; and

an application for processing the objects, wherein the application includes a system for processing the unique identifier.

10. The system of claim 9, wherein the application comprises a referencing system that allows objects in the database to be tracked.

11. The system of claim 9, wherein the application comprises a time checking system that extracts time information from the unique identifiers provided to the objects.

12. The system of claim 11, wherein the objects comprise events and the time checking system compares a time difference between events.

13. The system of claim 9, wherein the application comprises a routing system that extracts location information from the unique identifiers provided to the objects.

14. The system of claim 13, wherein the objects comprise routers in a network, and the applications routes data by examining the location information associated with each router.

15. The system of claim 9, wherein the application comprises a security system.

16. The system of claim 15, wherein objects comprise login events to a computer system, and the security system ensures that each unique identifier is not afforded multiple login events.

17. The system of claim 9, wherein the application comprises a data translation system that extracts information from the unique identifier and translates it into a different format.

18. The system of claim 9, wherein the objects comprise limited use transactions, and the application validates each transaction.

19. A method of generating object identifiers, comprising the steps of:

obtaining time and location information from a global positioning system (GPS);

generating a unique identifier from the time and location information, wherein the time and location information is encoded into the unique identifier; and

associating the unique identifier with an object.

20. The method of claim 19, wherein the object exists at a time and location where the time and location information is received.

21. The method of claim 19, comprising the further step of extracting the time information from the unique identifier in order to process the object.

22. The method of claim 21, comprising the further step of comparing the time information extracted from a first and second object.

23. The method of claim 19, comprising the further step of extracting the location information from the unique identifier in order to process the object.

24. The method of claim 19, comprising the further step of tracking the object using the unique identifier.

* * * * *

US006212475B1

(12) **United States Patent**
France et al.

(10) **Patent No.: US 6,212,475 B1**
(45) **Date of Patent: Apr. 3, 2001**

(54) **METHOD AND APPARATUS FOR AUTOMATED DIFFERENT GPS PROCESSING**

(75) Inventors: **Peter Glen France**, Christchurch (NZ); **Paul D. Perreault**, Palo Alto, CA (US)

(73) Assignee: **Trimble Navigation Limited**, Sunnyvale, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/337,567**

(22) Filed: **Jun. 22, 1999**

Related U.S. Application Data

(63) Continuation of application No. 08/702,761, filed on Aug. 22, 1996, now Pat. No. 5,928,306.

(51) **Int. Cl.**[7] **G01S 5/02**

(52) **U.S. Cl.** **701/214**; 701/215; 701/213; 701/207; 342/451; 342/357

(58) **Field of Search** 701/215, 207, 701/300, 213, 214; 342/451, 357

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,345,244	9/1994	Gildea et al. .	
5,432,841	7/1995	Rimer .	
5,563,607 *	10/1996	Loomis et al.	342/357
5,638,077	6/1997	Martin .	
5,717,406	2/1998	Sanderford et al. .	
5,717,737	2/1998	Doviak et al. .	
5,724,316	3/1998	Brunts .	
5,777,580	7/1998	Janky et al. .	

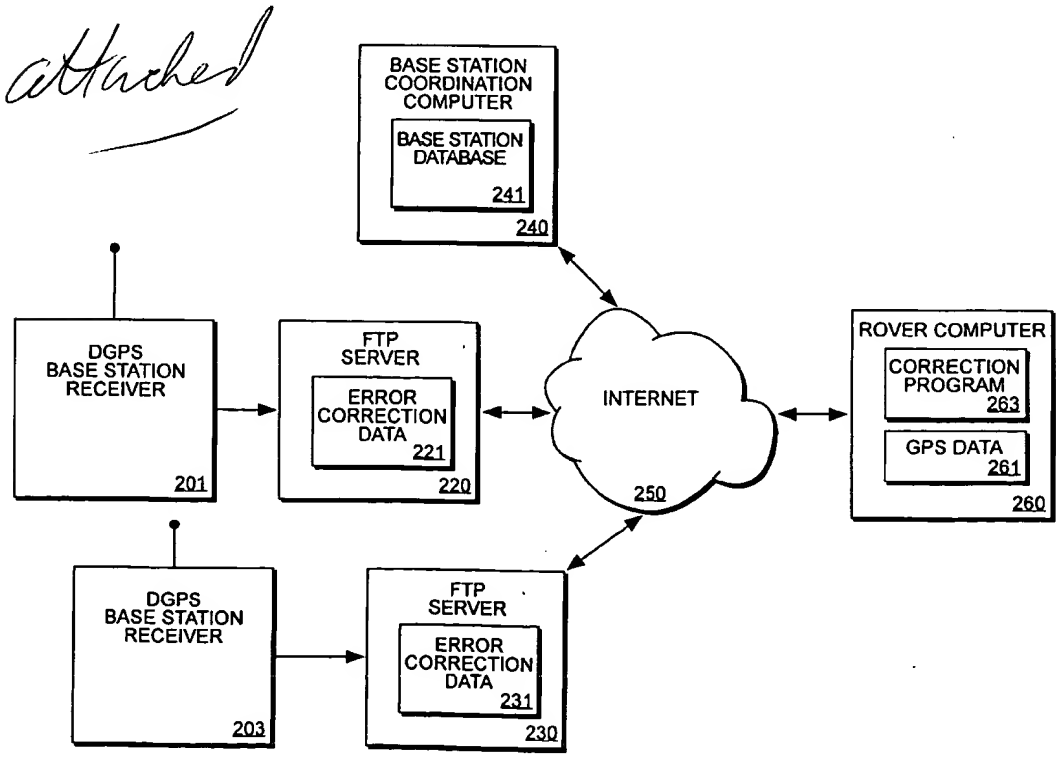
* cited by examiner

Primary Examiner—William A. Cuchlinski, Jr.
Assistant Examiner—Arthur Donnelly
(74) *Attorney, Agent, or Firm*—Blakely, Sokoloff, Taylor & Zafman LLP

(57) **ABSTRACT**

GPS position information is collected and stored in a computer system. The GPS position information includes time-stamps that indicates when the GPS position information was collected. The computer system uses the time stamps to generate an error correction file name for an error correction file that can be used to correct the GPS position information. Using the generated error correction file name, the computer system connects to a file server that stores differential GPS error correction files and copies the needed differential GPS error correction file. The computer system connects to the DGPS file server using the File Transfer Protocol of the global Internet. The computer system then corrects the GPS position information in the computer system using the retrieved DGPS error correction file

13 Claims, 7 Drawing Sheets



not transmitted in hour length files. In the alternate embodiment, the start and end times are transmitted to the server that stores the DGPS error correction information. The server then begins streaming the DGPS error correction information to the requester.

To use the streamed DGPS error correction information, a "plug-in" program that helps the World Wide Web browser interpret and display the DGPS error correction information is used. The World Wide Web browser provides the streamed information to the plug-in DGPS error correction program and that plug-in program performs the DGPS error correction. Alternatively, a single DGPS error correction program can be designed to send and receive information using the HTTP protocol. This stand-alone DGPS error correction program would not require the help of a World Wide Web browser program.

By implementing a streaming version of the DGPS error correction system, only the required DGPS error correction information is retrieved. For example, if only five minutes of GPS information was collected, then only a corresponding 5 minutes of DGPS error correction information would be retrieved. Thus, the streaming version uses network bandwidth more efficiently than a file based DGPS error correction system.

Near Real-Time Differential GPS Correction

To achieve near real-time differential GPS correction, the rover computer must be coupled directly to the Internet while it is receiving position data. With the advent of new wireless communication systems, this will be possible using standardized technology. For example, Metricom of Los Gatos, Calif. offers a wireless Internet service know as "Ricochet". The Ricochet wireless Internet service replaces the standard telephone modem with a wireless modem designed for Metricom's wireless digital network. Due to the increasing popularity of the Internet, such wireless Internet service can now be obtained at very inexpensive prices in certain areas. For example, wireless Internet service can be obtained for less than $30 per month in California's Silicon Valley.

Server to Rover embodiment

FIG. **6** illustrates one embodiment of a system that allows near real-time correction of GPS information using a wireless internet connection such as Ricochet by Metricom. Thus, the rover GPS unit **610** must be capable of receiving GPS information from satellites and communicating with a wireless Internet access server **650**. The wireless Internet access server **650** provides access to the Internet **620**. A DGPS corrector program running on the rover GPS unit **610** controls the DGPS correction.

The DGPS corrector program accesses a Telnet server **603** that is connected to a differential GPS base station **605**. The Telnet server **603** receives the DGPS error correction data that is continually being generated by the differential GPS base station **605**. Once the GPS corrector program connects to the Telnet server **603**, the GPS corrector program runs a program on the Telnet server **603** that provides a continuous feed of the correction information as it is generated.

The GPS corrector program combines the error correction data received from the Telnet server **603** with the GPS information that is generated by the rover GPS unit **610**. Due to communication delays, the rover GPS unit **610** will likely need to maintain delay buffers for both the GPS information generated on the rover GPS unit **610** and the error correction data received from the Telnet server **603**. The two data streams are matched up using time-stamps. Since the DGPS correction is not instantaneous, it is termed "near real-time DGPS error correction."

Rover to Server Embodiment

Instead of having the Server transmit the error correction data to the rover GPS unit **610**, the data transmission path can be reversed such that the rover GPS unit **610** transmits the uncorrected GPS position information directly to a server. The Server may be same server used to obtain DGPS error correction information (such as server **603**) or the server may be any other server connected to the Internet such as server **690** with DGPS error corrector program **695**. The server that receives the uncorrected GPS position information from the rover can perform the DGPS error correction. Thus, the rover GPS unit **610** can be a very inexpensive DGPS receiver system that merely transmits the uncorrected GPS position information to a server. The server then has the responsibility of locating the proper DGPS error correction information and performing the DGPS error correction calculations.

In the foregoing specification the invention has been described with reference to specific exemplary embodiments thereof. It will, however, be evident that various modifications and changes may be made thereto without departing from the broader spirit and scope of the invention as set forth in the appended claims. The specification and drawings are, accordingly, to be regarded in an illustrative rather than restrictive sense.

What is claimed is:

1. A method of near real-time Differential Global Positioning System (DGPS) error correction, said method comprising:

generating DGPS error correction information on a DGPS base station having a known location;

transmitting DGPS error correction information to a server coupled to said base station;

receiving Global Positioning System (GPS) information on a rover GPS unit, said rover GPS unit having a wireless connection; and

processing said GPS information with said DGPS error correction information.

2. The method of claim **1**, wherein said rover GPS unit communicates with a wireless server.

3. The method of claim **2**, wherein said wireless server comprises a wireless link to an Internet access port.

4. The method of claim **1**, wherein the step of processing is performed on the server, said method further comprising the steps of said rover GPS unit transmitting said GPS information to the server using the wireless connection.

5. The method of claim **1**, wherein the step of processing is performed on the rover GPS unit, said method further comprising the steps of said rover GPS unit receiving said DGPS error correction information using the wireless connection.

6. A method of near real-time Differential Global Positioning System (DGPS) error correction, said method comprising:

generating DGPS error correction information on a DGPS base station having a known location;

transmitting said DGPS error correction information to a server coupled to the base station;

streaming said DGPS error correction information to a rover Global Positioning System (GPS) unit wirelessly coupled to the server;

receiving GPS information on said rover GPS unit;

processing said GPS information with said DGPS error correction information.

7. The method of claim **6**, wherein the server comprises a wireless link to an Internet access port.

8. A system comprising a rover Global Positioning System (GPS) unit configured to receive GPS information and transmit wirelessly the GPS information to a server which is configured to receive Differential GPS (DGPS) error correction information from a base station of a known location and process the GPS information with the DPGS error correction information.

9. A system comprising a rover Global Positioning System (GPS) unit configured to receive GPS information and Differential GPS (DGPS) error correction information and process the GPS information with the DPGS error correction information, said rover GPS unit configured to receive DGPS error correction information wirelessly from a DGPS server coupled to a base station with a known location.

10. A system comprising a Differential Global Positioning System (DGPS) server configured to be coupled to a base station and a rover Global Positioning System (GPS) unit, said base station configured to provide DGPS error correction information to the DGPS server, said DGPS server configured to wirelessly communicate with said rover GPS unit such that said GPS information is processed with the DGPS error correction information.

11. The system as set forth in claim **10**, wherein said server is further configured to receive the GPS information from the rover GPS unit through a wireless connection and process the GPS information with the DGPS error correction information.

12. The system as set forth in claim **10**, wherein the server is further configured to transmit the DGPS information to the rover GPS unit through a wireless connection.

13. The system as set forth in claim **10**, wherein the server comprises a wireless link to an Internet access port.

* * * * *

US005928306A

United States Patent [19]

France et al.

[11] Patent Number: 5,928,306

[45] Date of Patent: Jul. 27, 1999

[54] METHOD AND APPARATUS FOR AUTOMATED DIFFERENTIAL GPS PROCESSING

[75] Inventors: Peter Glen France, Christchurch, New Zealand; Paul D. Perreault, Palo Alto, Calif.

[73] Assignee: Trimble Navigation Limited, Sunnyvale, Calif.

[21] Appl. No.: 08/702,761

[22] Filed: Aug. 22, 1996

[51] Int. Cl.[6] G01C 21/20

[52] U.S. Cl. 701/207; 701/300; 342/451

[58] Field of Search 342/357, 457, 342/451; 701/207, 300

[56] References Cited

U.S. PATENT DOCUMENTS

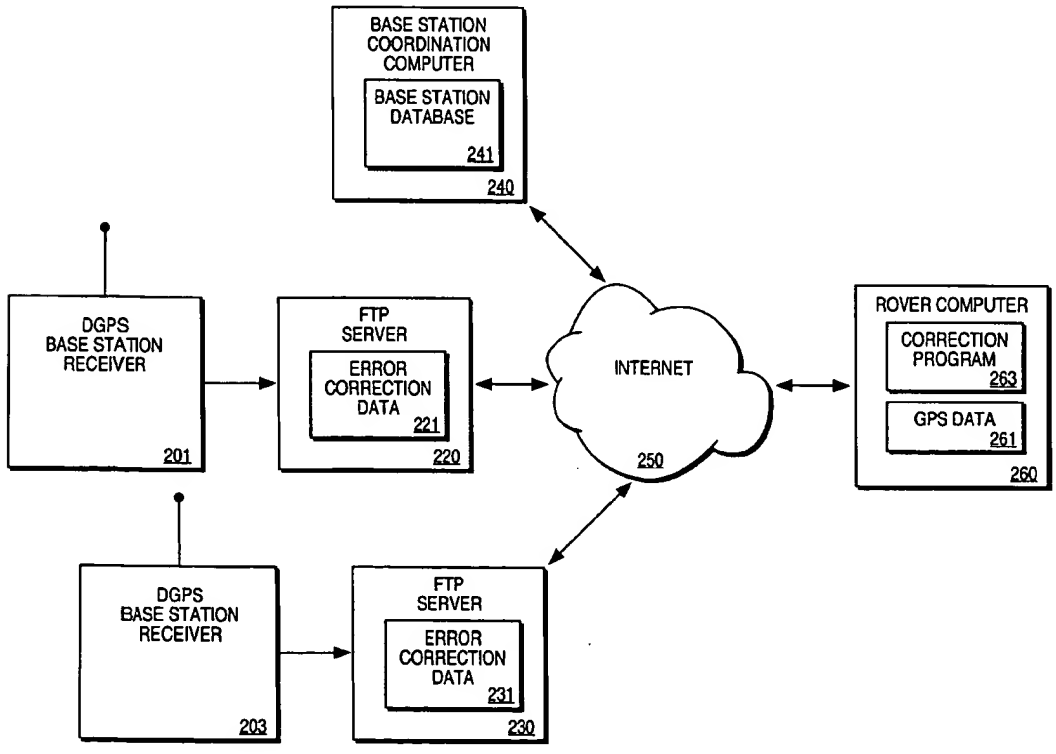
5,345,244	9/1994	Gildea et al.	342/357
5,432,841	7/1995	Rimer	379/59
5,563,607	10/1996	Loomis et al.	342/357
5,638,077	6/1997	Martin	342/357
5,717,406	2/1998	Sanderford et al.	342/457
5,717,737	2/1998	Doviak et al.	379/58
5,724,316	3/1998	Brunts	368/10
5,777,580	7/1998	Janky et al.	342/457

Primary Examiner—William A. Cuchlinski, Jr.
Assistant Examiner—Arthur Donnelly
Attorney, Agent, or Firm—Blakely, Sokoloff, Taylor & Zafman LLP

[57] ABSTRACT

GPS position information is collected and stored in a computer system. The GPS position information includes time-stamps that indicates when the GPS position information was collected. The computer system uses the time stamps to generate an error correction file name for an error correction file that can be used to correct the GPS position information. Using the generated error correction file name, the computer system connects to a file server that stores differential GPS error correction files and copies the needed differential GPS error correction file. The computer system connects to the DGPS file server using the File Transfer Protocol of the global Internet. The computer system then corrects the GPS position information in the computer system using the retrieved DGPS error correction file.

19 Claims, 7 Drawing Sheets



To use the streamed DGPS error correction information, a "plug-in" program that helps the World Wide Web browser interpret and display the DGPS error correction information is used. The World Wide Web browser provides the streamed information to the plug-in DGPS error correction program and that plug-in program performs the DGPS error correction. Alternatively, a single DGPS error correction program can be designed to send and receive information using the HTTP protocol. This stand-alone DGPS error correction program would not require the help of a World Wide Web browser program.

By implementing a streaming version of the DGPS error correction system, only the required DGPS error correction information is retrieved. For example, if only five minutes of GPS information was collected, then only a corresponding 5 minutes of DGPS error correction information would be retrieved. Thus, the streaming version uses network bandwidth more efficiently than a file based DGPS error correction system.

Near Real-Time Differential GPS Correction

To achieve near real-time differential GPS correction, the rover computer must be coupled directly to the Internet while it is receiving position data. With the advent of new wireless communication systems, this will be possible using standardized technology. For example, Metricom of Los Gatos, Calif. offers a wireless Internet service know as "Ricochet". The Ricochet wireless Internet service replaces the standard telephone modem with a wireless modem designed for Metricom's wireless digital network. Due to the increasing popularity of the Internet, such wireless Internet service can now be obtained at very inexpensive prices in certain areas. For example, wireless Internet service can be obtained for less than $30 per month in California's Silicon Valley.

Server to Rover Embodiment

FIG. **6** illustrates one embodiment of a system that allows near real-time correction of GPS information using a wireless internet connection such as Ricochet by Metricom. Thus, the rover GPS unit **610** must be capable of receiving GPS information from satellites and communicating with a wireless Internet access server **650**. The wireless Internet access server **650** provides access to the Internet **620**. A DGPS corrector program running on the rover GPS unit **610** controls the DGPS correction.

The DGPS corrector program accesses a Telnet server **603** that is connected to a differential GPS base station **605**. The Telnet server **603** receives the DGPS error correction data that is continually being generated by the differential GPS base station **605**. Once the GPS corrector program connects to the Telnet server **603**, the GPS corrector program runs a program on the Telnet server **603** that provides a continuous feed of the correction information as it is generated.

The GPS corrector program combines the error correction data received from the Telnet server **603** with the GPS information that is generated by the rover GPS unit **610**. Due to communication delays, the rover GPS unit **610** will likely need to maintain delay buffers for both the GPS information generated on the rover GPS unit **610** and the error correction data received from the Telnet server **603**. The two data streams are matched up using time-stamps. Since the DGPS correction is not instantaneous, it is termed "near real-time DGPS error correction."

Rover to Server Embodiment

Instead of having the Server transmit the error correction data to the rover GPS unit **610**, the data transmission path can be reversed such that the rover GPS unit **610** transmits the uncorrected GPS position information directly to a server. The Server may be same server used to obtain DGPS error correction information (such as server **603**) or the server may be any other server connected to the Internet such as server **690** with DGPS error corrector program **695**. The server that receives the uncorrected GPS position information from the rover can perform the DGPS error correction. Thus, the rover GPS unit **610** can be a very inexpensive DGPS receiver system that merely transmits the uncorrected GPS position information to a server. The server then has the responsibility of locating the proper DGPS error correction information and performing the DGPS error correction calculations.

In the foregoing specification the invention has been described with reference to specific exemplary embodiments thereof. It will, however, be evident that various modifications and changes may be made thereto without departing from the broader spirit and scope of the invention as set forth in the appended claims. The specification and drawings are, accordingly, to be regarded in an illustrative rather than restrictive sense.

What is claimed is:

1. A computer implemented method of correcting GPS position information, said method comprising:

storing GPS position information in a computer system, said GPS position information having at least one time-stamp that indicates when said GPS position information was collected;

opening a connection from said computer system to a base station coordination computer;

requesting said base station coordination computer for an address of a file server that contains DGPS error correction files from a base station closest to a position indicated by said GPS position information;

generating at least one DGPS error correction file name based upon said time-stamp;

connecting said computer system to a file server associated with said nearest DGPS base station;

copying a DGPS error correction file on said file server having said DGPS error correction file name into said computer system; and

correcting said GPS position information in said computer system using said DGPS error correction file.

2. The method of claim **1** wherein said step of generating at least one error correction file name comprises:

generating a file name based upon a time and a date when said GPS position information was collected; and

adding a suffix that identifies a DGPS error correction file.

3. The method of claim **1** wherein said step of correcting said GPS position information comprises:

decompressing said DGPS error correction file; and

applying said error correction file to said GPS position information.

4. A computer implemented method of correcting GPS position information, said method comprising:

storing GPS position information in a computer system, said GPS position information having at least one time-stamp that indicates when said GPS position information was collected;

examining said GPS position information to determine a nearest DGPS base station;

generating at least one DGPS error correction file name based upon said time-stamp;

connecting said computer system to a file server associated with said nearest DGPS base station;

opening an File Transfer Protocol connection from said computer system to said file server;

executing a "get" operation to get a DGPS error correction file having said DGPS error correction file name into said computer system; and

correcting said GPS position information in said computer system using said DGPS error correction file.

5. A computer system for correcting said GPS position information, said computer system comprising:

a computer system having GPS position information that needs to be corrected, said computer system coupled to a network;

at least one base station server coupled to said network, said base station server having a network address, said base station server having DGPS error correction files from an associated DGPS base station at a known position; and

a base station coordination computer, said base station coordination computer having the network addresses of said base station server computers and the known position of said associated DGPS base stations.

6. The computer system of claim 5 wherein said network comprises the global Internet.

7. A method of correcting GPS position information, said method comprising:

storing GPS position information in a computer system, said GPS position information having at least one time-stamp that indicates when said GPS position information was collected;

accessing a DGPS web site using a web browser on said computer system;

downloading an applet from said DGPS web site, said applet examining said GPS position information to determine a nearest DGPS base station;

generating at least one error correction file name based upon said time-stamp;

connecting said computer system to a file server associated with said nearest DGPS base station;

copying an error correction file on said file server having said error correction file name into said computer system; and

correcting said GPS position information in said computer system using said error correction file.

8. A computer implemented method of correcting GPS position information, said method comprising:

storing GPS position information in a computer system, said GPS position information having at least one time-stamp that indicates when said GPS position information was collected;

locating at least one DGPS error correction file based upon said time-stamp, said locating comprising

scanning a directory for at least one DGPS error correction file, said step of scanning comprising determining a start time and a end time for each DGPS error correction file,

selecting at least one DGPS error correction file based upon a time and a date when said GPS position information was collected, and

correcting said GPS position information in said computer system using said error correction file.

9. The method of claim 8 wherein said step of locating at least one DGPS error correction file comprises:

generating a file name based upon a time and a date when said GPS position information was collected; and

adding a suffix that identifies a DGPS error correction file; and

examining said directory for a file with said generated file name.

10. The method of claim 8 wherein said step of locating at least one DGPS error correction file further comprises:

generating a DGPS error correction file name based upon a time and a date when said GPS position information was collected; and

using a first DGPS error correction file having said DGPS error correction file name if said first DGPS error correction file exists;

scanning saidu directory for a second DGPS error correction file if said first DGPS error correction file does not exist, said step of scanning comprising determining a start time and a end time for each DGPS error correction file; and

selecting said second DGPS error correction file based upon said time and said date when said GPS position information was collected.

11. A method of correcting GPS position information, said method comprising:

generating DGPS error correction information on a DGPS base station, said DGPS base station having a known location;

storing said DGPS error correction information on a DGPS server coupled to said base station, said DGPS server coupled to a network;

collecting GPS position information with a rover GPS system, said rover GPS system having a wireless network connection;

coupling said rover GPS system to said DGPS server with said wireless network device;

processing said GPS position information with said DGPS error correction information.

12. The method of correcting GPS position information as claimed in claim 11 wherein said wireless network connection on said rover GPS system comprises a wireless Internet access.

13. The method of correcting GPS position information as claimed in claim 11 wherein said rover GPS system couples to said DGPS server using telnet protocol and said DGPS server streams DGPS correction information to said rover GPS unit.

14. The method of correcting GPS position information as claimed in claim 11 wherein said rover GPS system couples to said DGPS server and said rover GPS unit transmits said GPS position information to said DGPS server.

15. A method of correcting GPS position information, said method comprising:

storing GPS position information in a local computer system, said GPS position information having at least one time-stamp that indicates when said GPS position information was collected;

determine a nearest DGPS base station that has DGPS error correction information with a dedicated DGPS correction program;

accessing a DGPS server having said DGPS error correction information from said nearest DGPS base station using a dedicated DGPS correction program running on said local computer system;

correcting said GPS position information in said local computer system using said DGPS error correction information.

16. The method of correcting GPS position information as claimed in claim 15 wherein said DGPS server is a World Wide Web server using HyperText Transport Protocol (HTTP).

17. The method of correcting GPS position information as claimed in claim 15 wherein said step of accessing a DGPS server having said DGPS error correction information comprises streaming said DGPS error correction information to said local computer system.

18. A method of correcting GPS position information, said method comprising:

storing GPS position information in a local computer system, said GPS position information having at least one time-stamp that indicates when said GPS position information was collected;

accessing DGPS web server using a web browser on said local computer system;

streaming DGPS error correction information from said DGPS web server to said local computer system;

correcting said GPS position information in said local computer system using said error correction information.

19. The method of correcting GPS position information as claimed in claim 18 wherein said step of correcting said GPS position information in said local computer system using said error correction information comprises passing said error correction information to a plug-in error correction program that works with said web browser.

* * * * *

39/3,K/40 (Item 40 from file: 350)
DIALOG(R)File 350:Derwent WPIX

0009547085 - Drawing available
WPI ACC NO: 1999-492595/
Related WPI Acc No: 2001-406796
XRPX Acc No: N1999-366794
Computer implemented GPS **positional information correcting method**
Patent Assignee: TRIMBLE NAVIGATION LTD (TRIM-N)
Inventor: FRANCE P G; PERREAULT P D
Patent Family (1 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update
US 5928306	A	19990727	US 1996702761	A	19960822	199941 B

Priority Applications (no., kind, date): US 1996702761 A 19960822

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing Notes
US 5928306	A	EN	15	6	

Computer implemented GPS **positional information correcting method**

Original Titles:
Method and apparatus for automated differential **GPS** processing.

Alerting Abstract ...NOVELTY - A computer (260) which stores **GPS** positional information files with **time stamp** , is connected to file servers (220,230) corresponding to nearest DGPS base stations (201,203). DGPS error correction **file name** is generated, based on **time stamp** and the file in server is copied by computer for correcting **GPS** positional information....correcting files is requested, from base station (201) that is closest to position indicated by **GPS** positional information. An INDEPENDENT CLAIM is also included for **GPS** positional information correcting apparatus...

...USE - For correcting positional information of **GPS** using computer...

...are stored in compressed form to reduce long term storage requirements and reduce file transmission **time** . Thus post processing error correction operation is performed automatically, without any need for user intervention...

...DESCRIPTION OF DRAWINGS - The figure shows computer arrangement for automatically retrieving differential **GPS** correction information through Internet...

Class Codes
Manual Codes (EPI/S-X): **S02-B08C** ...

... **S02-B08G** ...

... **T01-H07C5S** ...

... **T01-J06B1**

Original Publication Data by Authority

Original Abstracts:

GPS position information is collected and stored in a computer system. The **GPS** position information includes **time - stamps** that indicates when the **GPS** position information was collected. The computer system uses the **time stamps** to generate an error correction **file name** for an error correction **file** that can be used to correct the **GPS** position information. Using the generated error correction **file name** , the computer system connects to a file server that stores differential **GPS** error correction files and copies the needed differential **GPS** error correction file. The computer system connects to the DGPS file server using the File Transfer Protocol of the global Internet. The computer system then corrects the **GPS** position information in the computer system using the retrieved DGPS error correction file.

Claims:

A computer implemented method of correcting **GPS** position information, said method comprising: storing **GPS** position information in a computer system, said **GPS** position information having at least one **time - stamp** that indicates when said **GPS** position information was collected; opening a connection from said computer system to a base station...

...DGPS error correction files from a base station closest to a position indicated by said **GPS** position information; generating at least one DGPS error correction **file name** based upon said **time - stamp** connecting said computer system to a file server associated with said nearest DGPS base station; copying a DGPS error correction file on said file server having said DGPS error correction **file name** into said computer system; and correcting said **GPS** position information in said computer system using said DGPS error correction file.

US 20030069893A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2003/0069893 A1

Kanai et al. (43) Pub. Date: Apr. 10, 2003

(54) SCHEME FOR MULTIMEDIA DATA RETRIEVAL USING EVENT NAMES AND TIME/LOCATION INFORMATION

(75) Inventors: Tatsunori Kanai, Kanagawa (JP); Seiji Maeda, Kanagawa (JP); Hiroshi Yao, Kanagawa (JP); Hirokuni Yano, Kanagawa (JP)

Correspondence Address:
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314 (US)

(73) Assignee: KABUSHIKI KAISHA TOSHIBA, Kawasaki-shi (JP)

(21) Appl. No.: 09/820,364

(22) Filed: Mar. 29, 2001

(30) Foreign Application Priority Data

Mar. 29, 2000 (JP) 2000-091024

Publication Classification

(51) Int. Cl.[7] G06F 17/30

(52) U.S. Cl. 707/104.1; 707/3

(57) ABSTRACT

In a multimedia data retrieval device, each one of a plurality of multimedia data is managed in relation to time information and/or location information indicating a time and/or a location at which each multimedia data is created. Then, the time information and/or the location information corresponding to a retrieval request are obtained upon receiving the retrieval request specified by using event names, and multimedia data are retrieved from the plurality of multimedia data according to the obtained time information and/or location information.

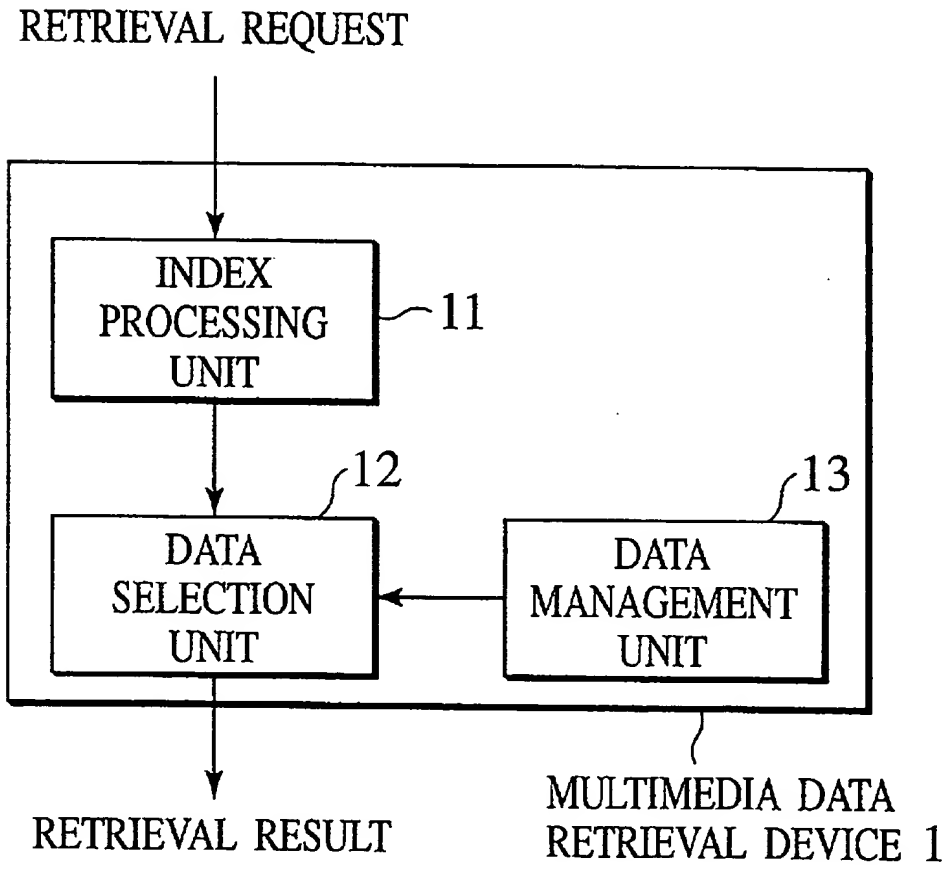


FIG.2

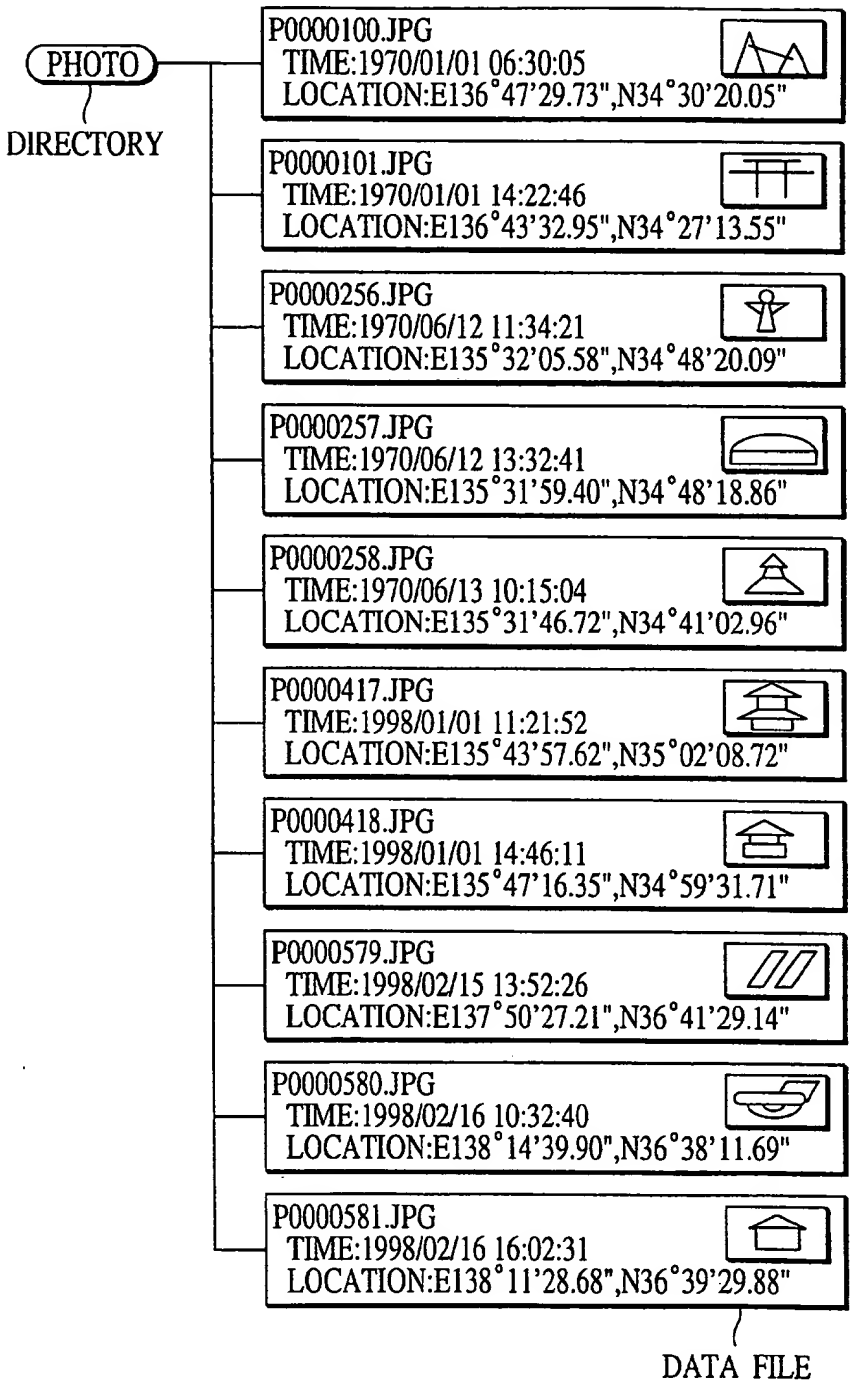


PHOTO
DIRECTORY
P0000100.JPG
TIME:1970/01/01 06:30:05
LOCATION:E136°47'29.73",N34°30'20.05"
P0000101.JPG
TIME:1970/01/01 14:22:46
LOCATION:E136°43'32.95",N34°27'13.55"
P0000256.JPG
TIME:1970/06/12 11:34:21
LOCATION:E135°32'05.58",N34°48'20.09"
P0000257.JPG
TIME:1970/06/12 13:32:41
LOCATION:E135°31'59.40",N34°48'18.86"
P0000258.JPG
TIME:1970/06/13 10:15:04
LOCATION:E135°31'46.72",N34°41'02.96"
P0000417.JPG
TIME:1998/01/01 11:21:52
LOCATION:E135°43'57.62",N35°02'08.72"
P0000418.JPG
TIME:1998/01/01 14:46:11
LOCATION:E135°47'16.35",N34°59'31.71"
P0000579.JPG
TIME:1998/02/15 13:52:26
LOCATION:E137°50'27.21",N36°41'29.14"
P0000580.JPG
TIME:1998/02/16 10:32:40
LOCATION:E138°14'39.90",N36°38'11.69"
P0000581.JPG
TIME:1998/02/16 16:02:31
LOCATION:E138°11'28.68",N36°39'29.88"
DATA FILE

FIG.3

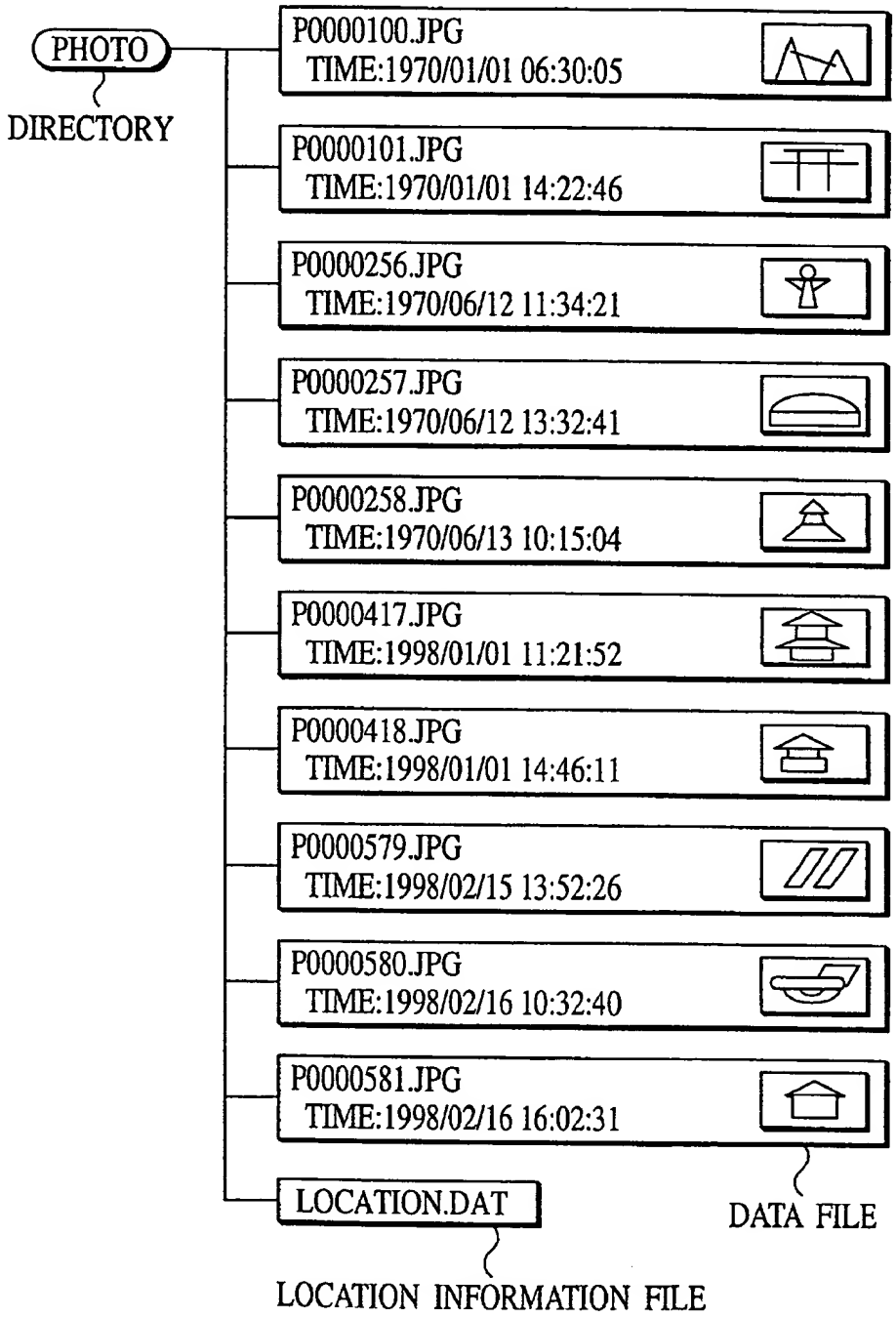


PHOTO
DIRECTORY
P0000100.JPG
TIME:1970/01/01 06:30:05
P0000101.JPG
TIME:1970/01/01 14:22:46
P0000256.JPG
TIME:1970/06/12 11:34:21
P0000257.JPG
TIME:1970/06/12 13:32:41
P0000258.JPG
TIME:1970/06/13 10:15:04
P0000417.JPG
TIME:1998/01/01 11:21:52
P0000418.JPG
TIME:1998/01/01 14:46:11
P0000579.JPG
TIME:1998/02/15 13:52:26
P0000580.JPG
TIME:1998/02/16 10:32:40
P0000581.JPG
TIME:1998/02/16 16:02:31
LOCATION.DAT
DATA FILE
LOCATION INFORMATION FILE

FIG.4

LOCATION INFORMATION FILE CONTENT

FILE NAME	LOCATION INFORMATION
P0000100.JPG	E136°47'29.73", N34°30'20.05"
P0000101.JPG	E136°43'32.95", N34°27'13.55"
P0000256.JPG	E135°32'05.58", N34°48'20.09"
P0000257.JPG	E135°31'59.40", N34°48'18.86"
P0000258.JPG	E135°31'46.72", N34°41'02.96"
P0000417.JPG	E135°43'57.62", N35°02'08.72"
P0000418.JPG	E135°47'16.35", N34°59'31.71"
P0000579.JPG	E137°50'27.21", N36°41'29.14"
P0000580.JPG	E138°14'39.90", N36°38'11.69"
P0000581.JPG	E138°11'28.68", N36°39'29.88"

FIG.6

ATTRIBUTE INFORMATION FILE CONTENT

FILE NAME	TIME INFORMATION	LOCATION INFORMATION
P0000100.JPG	1970/01/01 06:30:05	E136°47'29.73", N34°30'20.05"
P0000101.JPG	1970/01/01 14:22:46	E136°43'32.95", N34°27'13.55"
P0000256.JPG	1970/06/12 11:34:21	E135°32'05.58", N34°48'20.09"
P0000257.JPG	1970/06/12 13:32:41	E135°31'59.40", N34°48'18.86"
P0000258.JPG	1970/06/13 10:15:04	E135°31'46.72", N34°41'02.96"
P0000417.JPG	1998/01/01 11:21:52	E135°43'57.62", N35°02'08.72"
P0000418.JPG	1998/01/01 14:46:11	E135°47'16.35", N34°59'31.71"
P0000579.JPG	1998/02/15 13:52:26	E137°50'27.21", N36°41'29.14"
P0000580.JPG	1998/02/16 10:32:40	E138°14'39.90", N36°38'11.69"
P0000581.JPG	1998/02/16 16:02:31	E138°11'28.68", N36°39'29.88"

FIG.9

EVENT NAME	START TIME	END TIME	LONGITUDE-1	LATITUDE-1	LONGITUDE-2	LATITUDE-2
U.S. PAVILION			E135°32'00.79"	N34°48'18.90"		
ISE-SHIMA			E136°36'55.00"	N34°34'41.86"	E136°56'41.94"	N34°15'06.58"
ISE-JINGU SHRINE			E136°43'39.53"	N34°27'09.81"		
M-WAVE			E138°14'36.12"	N36°38'15.03"		
OSAKA			E135°25'11.90"	N34°43'46.34"	E136°34'31.83"	N34°35'28.22"
OSAKA-JO CASTLE			E135°31'43.12"	N34°41'03.14"		
KYOTO			E135°38'59.49"	N35°06'15.19"	E135°50'04.32"	N34°54'56.38"
KIYOMIZUDERA TEMPLE			E135°47'17.52"	N34°59'28.58"		
KINKAKUJI TEMPLE			E135°43'55.44"	N35°02'10.07"		
ZENKOJI TEMPLE			E138°11'27.28"	N36°39'30.40"		
TOWER OF THE SUN			E135°32'06.26"	N34°48'22.31"		
NAGANO OLYMPICS	1998/2/7	1998/2/22	E137°44'09.26"	N36°42'50.84"	E138°12'22.71"	N35°38'51.60"
NAGANO			E137°44'09.26"	N36°42'50.84"	E138°12'22.71"	N35°38'51.60"
JAPAN EXPO	1970/3/14	1970/9/13	E135°31'22.20"	N34°48'50.41"	E135°32'43.65"	N34°47'57.92"
HAKUBA JUMP SLOPE			E137°50'22.21"	N36°41'30.34"		
MEOTOIWA ROCKS			E136°47'29.44"	N34°30'20.98"		

sponding to the retrieval request that are obtained according to the event names from the index table or the index server, so that there is no need for tedious tasks of classifying the multimedia data to be managed into directories or folders or attaching keywords for the purpose of the retrieval, and it becomes possible to retrieve the desired multimedia data by using an event name or a combination of event names that are intuitive and easily comprehensible for the users.

[0236] It is to be noted that the above described embodiments according to the present invention may be conveniently implemented using a conventional general purpose digital computer programmed according to the teachings of the present specification, as will be apparent to those skilled in the computer art. Appropriate software coding can readily be prepared by skilled programmers based on the teachings of the present disclosure, as will be apparent to those skilled in the software art.

[0237] In particular, the multimedia data retrieval device or the index server of each of the above described embodiments can be conveniently implemented in a form of a software package.

[0238] Such a software package can be a computer program product which employs a storage medium including stored computer code which is used to program a computer to perform the disclosed function and process of the present invention. The storage medium may include, but is not limited to, any type of conventional floppy disks, optical disks, CD-ROMs, magneto-optical disks, ROMs, RAMs, EPROMs, EEPROMs, magnetic or optical cards, or any other suitable media for storing electronic instructions.

[0239] It is also to be noted that, besides those already mentioned above, many modifications and variations of the above embodiments may be made without departing from the novel and advantageous features of the present invention. Accordingly, all such modifications and variations are intended to be included within the scope of the appended claims.

What is claimed is:

1. A multimedia data retrieval method, comprising:

(a) managing each one of a plurality of multimedia data in relation to time information and/or location information indicating a time and/or a location at which each multimedia data is created;

(b) obtaining the time information and/or the location information corresponding to a retrieval request upon receiving the retrieval request specified by using event names; and

(c) retrieving multimedia data from the plurality of multimedia data managed by the step (a), according to the time information and/or the location information obtained by the step (b).

2. The method of claim 1, wherein the step (b) obtains the time information and/or the location information corresponding to the retrieval request by referring to an index table that contains a plurality of event names and the time information and/or the location information that are related to each event name.

3. The method of claim 2, wherein the step (b) utilizes schedule data as the index table, by taking name information indicating schedule contents as the event names, date and time information of schedules as the time information, and place information of schedules as the location information.

4. The method of claim 1, wherein the step (b) obtains the time information and/or the location information corresponding to the retrieval request from an index server by transmitting the retrieval request to the index server which has a function for obtaining the time information and/or the location information that are related to each event name.

5. The method of claim 1, further comprising:

(d) obtaining the time information and/or the location information that are related to one multimedia data upon receiving a reverse look-up retrieval request specifying said one multimedia data; and

(e) retrieving event names according to the time information and/or the location information obtained by the step (d) as a reverse look-up retrieval result.

6. The method of claim 1, wherein the step (a) manages each multimedia data in relation to the time information and/or the location information which are automatically created in relation to a creation of each multimedia data.

7. A multimedia data retrieval device, comprising:

a data management unit configured to manage each one of a plurality of multimedia data in relation to time information and/or location information indicating a time and/or a location at which each multimedia data is created;

a processing unit configured to obtain the time information and/or the location information corresponding to a retrieval request upon receiving the retrieval request specified by using event names; and

a data selection unit configured to retrieve multimedia data from the plurality of multimedia data managed by the data management unit, according to the time information and/or the location information obtained by the processing unit.

8. A computer usable medium having computer readable program codes embodied therein for causing a computer to function as a multimedia data retrieval device, the computer readable program codes include:

a first computer readable program code for causing said computer to manage each one of a plurality of multimedia data in relation to time information and/or location information indicating a time and/or a location at which each multimedia data is created;

a second computer readable program code for causing said computer to obtain the time information and/or the location information corresponding to a retrieval request upon receiving the retrieval request specified by using event names; and

a third computer readable program code for causing said computer to retrieve multimedia data from the plurality of multimedia data managed by the first computer readable program code, according to the time information and/or the location information obtained by the second computer readable program code.

9. An index information providing method, comprising:

(a) receiving a retrieval request specified by using event names, through a network from a requester;

(b) obtaining time information and/or location information corresponding to the retrieval request received by the step (a) according to the event names used in the retrieval request by referring to an index table that contains a plurality of event names and the time information and/or the location information that are related to each event name, the time information and/or the location information indicating a time and/or a location at which each multimedia data is created; and

(c) providing the time information and/or the location information obtained by the step (b) as an index information, through the network to the requestor.

10. The method of claim 9, wherein the index table includes a plurality of personal index tables and a common index table, and the step (b) obtains the time information and/or the location information by referring at least to one of the personal index table corresponding to the requester and the common index table.

11. The method of claim 9, wherein the step (b) utilizes schedule data as the index table, by taking name information indicating schedule contents as the event names, date and time information of schedules as the time information, and place information of schedules as the location information.

12. An index server, comprising:

a request reception unit configured to receive a retrieval request specified by using event names, through a network from a requester;

a processing unit configured to obtain time information and/or location information corresponding to the retrieval request received by the request reception unit according to the event names used in the retrieval request by referring to an index table that contains a plurality of event names and the time information and/or the location information that are related to each event name, the time information and/or the location information indicating a time and/or a location at which each multimedia data is created; and

an index information transmission unit configured to provide the time information and/or the location information obtained by the processing unit as an index information, through the network to the requester.

13. A computer usable medium having computer readable program codes embodied therein for causing a computer to function as an index server, the computer readable program codes include:

a first computer readable program code for causing said computer to receive a retrieval request specified by using event names, through a network from a requester;

a second computer readable program code for causing said computer to obtain time information and/or location information corresponding to the retrieval request received by the first computer readable program code according to the event names used in the retrieval request by referring to an index table that contains a plurality of event names and the time information and/or the location information that are related to each event name, the time information and/or the location information indicating a time and/or a location at which each multimedia data is created; and

a third computer readable program code for causing said computer to provide the time information and/or the location information obtained by the second computer readable program code as an index information, through the network to the requester.

14. A multimedia data retrieval method, comprising:

(a) managing each one of a plurality of multimedia data in relation to time information and/or location information indicating a time and/or a location at which each multimedia data is created;

(b) receiving a retrieval request specified by using event names, through a network from a requester;

(c) obtaining the time information and/or the location information corresponding to the retrieval request received by the step (b);

(d) retrieving multimedia data from the plurality of multimedia data managed by the step (a), according to the time information and/or the location information obtained by the step (c); and

(e) providing the multimedia data retrieved by the step (d) as a retrieval result, through the network to the requestor.

15. The method of claim 14, wherein the step (c) obtains the time information and/or the location information corresponding to the retrieval request by referring to an index table that contains a plurality of event names and the time information and/or the location information that are related to each event name.

16. The method of claim 14, further comprising:

(f) obtaining the time information and/or the location information that are related to one multimedia data upon receiving a reverse look-up retrieval request specifying said one multimedia data; and

(g) retrieving event names according to the time information and/or the location information obtained by the step (f) as a reverse look-up retrieval result.

17. A multimedia data retrieval server, comprising:

a data management unit configured to manage each one of a plurality of multimedia data in relation to time information and/or location information indicating a time and/or a location at which each multimedia data is created;

a request reception unit configured to receive a retrieval request specified by using event names, through a network from a requestor;

a processing unit configured to obtain the time information and/or the location information corresponding to the retrieval request received by the request reception unit;

a data selection unit configured to retrieve multimedia data from the plurality of multimedia data managed by the data management unit, according to the time information and/or the location information obtained by the processing unit; and

a retrieval result transmission unit configured to provide the multimedia data retrieved by the data selection unit as a retrieval result, through the network to the requester.

18. A computer usable medium having computer readable program codes embodied therein for causing a computer to

function as a multimedia data retrieval server, the computer readable program codes include:

a first computer readable program code for causing said computer to manage each one of a plurality of multimedia data in relation to time information and/or location information indicating a time and/or a location at which each multimedia data is created;

a second computer readable program code for causing said computer to receive a retrieval request specified by using event names, through a network from a requestor;

a third computer readable program code for causing said computer to obtain the time information and/or the location information corresponding to the retrieval request received by the second computer readable program code;

a fourth computer readable program code for causing said computer to retrieve multimedia data from the plurality of multimedia data managed by the first computer readable program code, according to the time information and/or the location information obtained by the third computer readable program code; and

a fifth computer readable program code for causing said computer to provide the multimedia data retrieved by the fourth computer readable program code as a retrieval result, through the network to the requestor.

19. A method for providing an index information providing service from an index server to multimedia data retrieval devices which are connected through a network, each multimedia data retrieval device managing each one of a plurality of multimedia data in relation to time information and/or location information indicating a time and/or a location at which each multimedia data is created, the method comprising:

(a) receiving a retrieval request specified by using event names, at the index server through the network from a requesting multimedia data retrieval device;

(b) obtaining the time information and/or the location information corresponding to the retrieval request received by the step (a) at the index server according to the event names used in the retrieval request by referring to an index table that contains a plurality of event names and the time information and/or the location information that are related to each event name; and

(c) providing the time information and/or the location information obtained by the step (b) as an index information, from the index server through the network to the requesting multimedia data retrieval device, so as to enable the requesting multimedia data retrieval device to retrieve multimedia data from the plurality of multimedia data according to the time information and/or the location information obtained from the index server.

20. A method for providing a multimedia data retrieval service from a multimedia data retrieval server to clients which are connected through a network, the method comprising:

(a) managing each one of a plurality of multimedia data at the multimedia data retrieval server in relation to time information and/or location information indicating a time and/or a location at which each multimedia data is created;

(b) receiving a retrieval request specified by using event names, at the multimedia data retrieval server through a network from a requesting client;

(c) obtaining the time information and/or the location information corresponding to the retrieval request received by the step (b) at the multimedia data retrieval server;

(d) retrieving multimedia data from the plurality of multimedia data managed by the step (a) at the multimedia data retrieval server, according to the time information and/or the location information obtained by the step (c); and

(e) providing the multimedia data retrieved by the step (d) as a retrieval result, from the multimedia data retrieval server through the network to the requesting client, so as to enable the requesting client to obtain the multimedia data matching with the retrieval request.

* * * * *